west virginia department of environmental protection

Division of Air Quality
601 57th Street SE
Charleston, WV 25304
Phone (304) 926-0475
Fax (304) 926-0479
www.dep.wv.gov

G35-D GENERAL PERMIT REGISTRATION APPLICATION

PREVENTION AND CONTROL OF AIR POLLUTION IN REGARD TO THE CONSTRUCTION, MODIFICATION, RELOCATION, ADMINISTRATIVE UPDATE AND OPERATION OF NATURAL GAS COMPRESSOR AND/OR DEHYDRATION FACILITIES

☐CONSTRUCTION
☒MODIFICATION
☐RELOCATION
☐CLASS I ADMINISTRATIVE UPDATE
☐CLASS II ADMINISTRATIVE UPDATE

SECTION 1. GENERAL INFORMATION

Name of Applicant (as registered with the WV Secretary of State's Office): HG Energy, LLC.

Federal Employer ID No. (FEIN): 27-4265157

Applicant's Mailing Address: 5260 Dupont Road

City: Parkersburg	State: WV	ZIP Code: 26101

Facility Name: Gans Compressor Station

Operating Site Physical Address: Springhill, PA (on state line)
If none available, list road, city or town and zip of facility.

City: Springhill, PA (on state line)	Zip Code: 15946	County: Monongalia

Latitude & Longitude Coordinates (NAD83, Decimal Degrees to 5 digits):
Latitude: 39.720556
Longitude: -79.793611

SIC Code: 1311 NAICS Code: 211111	DAQ Facility ID No. (For existing facilities) 061-00149

CERTIFICATION OF INFORMATION

This G35-D General Permit Registration Application shall be signed below by a Responsible Official. A Responsible Official is a President, Vice President, Secretary, Treasurer, General Partner, General Manager, a member of the Board of Directors, or Owner, depending on business structure. A business may certify an Authorized Representative who shall have authority to bind the Corporation, Partnership, Limited Liability Company, Association, Joint Venture or Sole Proprietorship. Required records of daily throughput, hours of operation and maintenance, general correspondence, compliance certifications and all required notifications must be signed by a Responsible Official or an Authorized Representative. If a business wishes to certify an Authorized Representative, the official agreement below shall be checked off and the appropriate names and signatures entered. **Any administratively incomplete or improperly signed or unsigned G35-D Registration Application will be returned to the applicant. Furthermore, if the G35-D forms are not utilized, the application will be returned to the applicant. No substitution of forms is allowed.**

I hereby certify that Matthew J. McGuire is an Authorized Representative and in that capacity shall represent the interest of the business (e.g., Corporation, Partnership, Limited Liability Company, Association Joint Venture or Sole Proprietorship) and may obligate and legally bind the business. If the business changes its Authorized Representative, a Responsible Official shall notify the Director of the Division of Air Quality immediately.

I hereby certify that all information contained in this G35-D General Permit Registration Application and any supporting documents appended hereto is, to the best of my knowledge, true, accurate and complete, and that all reasonable efforts have been made to provide the most comprehensive information possible.

Responsible Official Signature: _____
Name and Title: Matthew J. McGuire, HSE Manager Phone: 304-420-1126 Fax: 304-863-3172
Email: mmcguire@hgenergyllc.com Date: 2/13/17

If applicable:
Authorized Representative Signature: _____
Name and Title: Phone: Fax:
Email: Date:

If applicable:
Environmental Contact
Name and Title: Phone: Fax:
Email: Date:

OPERATING SITE INFORMATION
Briefly describe the proposed new operation and/or any change(s) to the facility: HG Energy intends to downsize the existing compressors at the facility, reducing the overall emissions.
Directions to the facility: At Morgantown, on I-68 East, take the Cheat Lake exit onto Route 857 N. Go approximately 6 miles and turn right into Laurel Aggregates Quarry. Stay to the left while going towards Lake Lynn Laboratory for 0.9 mile. Turn right, go 0.3 mile. Turn right, through gate to compressor facility.

ATTACHMENTS AND SUPPORTING DOCUMENTS	
I have enclosed the following required documents:	
Check payable to WVDEP – Division of Air Quality with the appropriate application fee (per 45CSR13 and 45CSR22). ☒ Check attached to front of application. ☐ I wish to pay by electronic transfer. Contact for payment (incl. name and email address): ☐ I wish to pay by credit card. Contact for payment (incl. name and email address): ☒$500 (Construction, Modification, and Relocation) ☐$300 (Class II Administrative Update) ☒$1,000 NSPS fee for 40 CFR60, Subpart IIII, JJJJ and/or OOOO and/or OOOOa [1] ☒$2,500 NESHAP fee for 40 CFR63, Subpart ZZZZ and/or HH [2] [1] Only one NSPS fee will apply. [2] Only one NESHAP fee will apply. The Subpart ZZZZ NESHAP fee will be waived for new engines that satisfy requirements by complying with NSPS, Subparts IIII and/or JJJJ. *NSPS and NESHAP fees apply to new construction or if the source is being modified.*	
☒ Responsible Official or Authorized Representative Signature (if applicable)	
☒ Single Source Determination Form **(must be completed in its entirety)** – Attachment A	
☐ Siting Criteria Waiver (if applicable) – Attachment B	☒ Current Business Certificate – Attachment C
☒ Process Flow Diagram – Attachment D	☒ Process Description – Attachment E
☒ Plot Plan – Attachment F	☒ Area Map – Attachment G
☒ G35-D Section Applicability Form – Attachment H	☒ Emission Units/ERD Table – Attachment I
☒ Fugitive Emissions Summary Sheet – Attachment J	
☒ Storage Vessel(s) Data Sheet (include gas sample data, USEPA Tanks, simulation software (e.g. ProMax, E&P Tanks, HYSYS, etc.), etc. where applicable) – Attachment K	
☒ Natural Gas Fired Fuel Burning Unit(s) Data Sheet (GPUs, Heater Treaters, In-Line Heaters if applicable) – Attachment L	
☒ Internal Combustion Engine Data Sheet(s) (include manufacturer performance data sheet(s) if applicable) – Attachment M	
☒ Tanker Truck Loading Data Sheet (if applicable) – Attachment N	
☒ Glycol Dehydration Unit Data Sheet(s) (include wet gas analysis, GRI- GLYCalc™ input and output reports and information on reboiler if applicable) – Attachment O	
☒ Pneumatic Controllers Data Sheet – Attachment P	
☒ Centrifugal Compressor Data Sheet – Attachment Q	
☒ Reciprocating Compressor Data Sheet – Attachment R	
☒ Blowdown and Pigging Operations Data Sheet – Attachment S	
☐ Air Pollution Control Device/Emission Reduction Device(s) Sheet(s) (include manufacturer performance data sheet(s) if applicable) – Attachment T	
☒ Emission Calculations (please be specific and include all calculation methodologies used) – Attachment U	
☐ Facility-wide Emission Summary Sheet(s) – Attachment V	
☒ Class I Legal Advertisement – Attachment W	
☒ One (1) paper copy and two (2) copies of CD or DVD with pdf copy of application and attachments	

All attachments must be identified by name, divided into sections, and submitted in order.

ATTACHMENT A - SINGLE SOURCE DETERMINATION FORM

Classifying multiple facilities as one "stationary source" under 45CSR13, 45CSR14, and 45CSR19 is based on the definition of Building, structure, facility, or installation as given in §45-14-2.13 and §45-19-2.12. The definition states:

"Building, Structure, Facility, or Installation" means all of the pollutant-emitting activities which belong to the same industrial grouping, are located on one or more contiguous or adjacent properties, and are under the control of the same person (or persons under common control). Pollutant-emitting activities are a part of the same industrial grouping if they belong to the same "Major Group" (i.e., which have the same two (2)-digit code) as described in the Standard Industrial Classification Manual, 1987 (United States Government Printing Office stock number GPO 1987 0-185-718:QL 3).

The Source Determination Rule for the oil and gas industry was published in the Federal Register on June 3, 2016 and will become effective on August 2, 2016. EPA defined the term "adjacent" and stated that equipment and activities in the oil and gas sector that are under common control will be considered part of the same source if they are located on the same site or on sites that share equipment and are within ¼ mile of each other.

Is there equipment and activities in the same industrial grouping (defined by SIC code)?

Yes ☐ No ☒

Is there equipment and activities under the control of the same person/people?

Yes ☐ No ☒

Is there equipment and activities located on the same site or on sites that share equipment and are within ¼ mile of each other?

Yes ☐ No ☒

ATTACHMENT C – CURRENT BUSINESS CERTIFICATE

If the applicant is a resident of West Virginia, the applicant should provide a copy of the current Business Registration Certificate issued to them from the West Virginia Secretary of State's Office. If the applicant is not a resident of the State of West Virginia, the registrant should provide a copy of the Certificate of Authority/Authority of LLC/Registration. This information is required for all sources to operate a business in West Virginia regardless of whether it is a construction, modification, or administrative update.

If you are a new business to West Virginia and have applied to the West Virginia Secretary of State's Office for a business license, please include a copy of your application.

Please note: Under the West Virginia Bureau of Employment Programs, 96CSR1, the DAQ may not grant, issue, or renew approval of any permit, general permit registration, or Certificate to Operate to any employing unit whose account is in default with the Bureau of Employment Programs Unemployment Compensation Division.

WEST VIRGINIA
STATE TAX DEPARTMENT
BUSINESS REGISTRATION CERTIFICATE

ISSUED TO:
HG ENERGY, LLC
5260 DUPONT RD
PARKERSBURG, WV 26101-7719

BUSINESS REGISTRATION ACCOUNT NUMBER: **2247-2861**

This certificate is issued on: **04/18/2012**

This certificate is issued by
the West Virginia State Tax Commissioner
in accordance with Chapter 11, Article 12, of the West Virginia Code

The person or organization identified on this certificate is registered to conduct business in the State of West Virginia at the location above.

This certificate is not transferrable and must be displayed at the location for which issued.

This certificate shall be permanent until cessation of the business for which the certificate of registration was granted or until it is suspended, revoked or cancelled by the Tax Commissioner.

Change in name or change of location shall be considered a cessation of the business and a new certificate shall be required.

TRAVELING/STREET VENDORS: Must carry a copy of this certificate in every vehicle operated by them. CONTRACTORS, DRILLING OPERATORS, TIMBER/LOGGING OPERATIONS: Must have a copy of this certificate displayed at every job site within West Virginia.

atL006 v.4
L0798323072

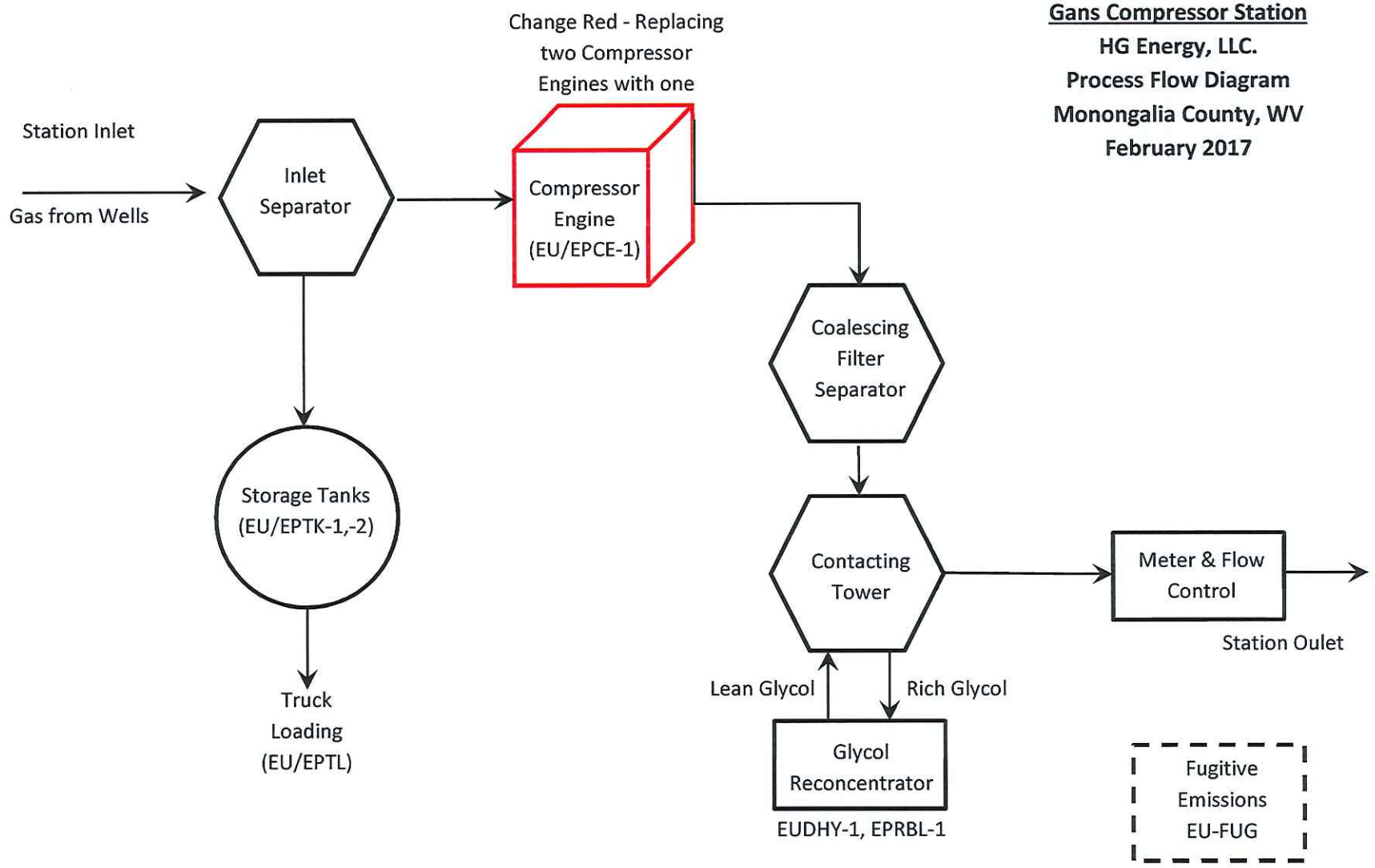
ATTACHMENT D – PROCESS FLOW DIAGRAM

Provide a diagram or schematic that supplements the process description of the operation. The process flow diagram must show all sources, components or facets of the operation in an understandable line sequence of operation. The process flow diagram should include the emission unit ID numbers, the pollution control device ID numbers, and the emission point ID numbers consistent with references in other attachments of the application. For a proposed modification, clearly identify the process areas, emission units, emission points, and/or control devices that will be modified, and specify the nature and extent of the modification.

Use the following guidelines to ensure a complete process flow diagram:

- The process flow diagram shall logically follow the entire process from beginning to end.
- Identify each emission source and air pollution control device with proper and consistent emission unit identification numbers, emission point identification numbers, and control device identification numbers.
- The process flow lines may appear different for clarity. For example, dotted lines may be used for vapor flow and solid lines used for liquid flow and arrows for direction of flow.
- The process flow lines may be color coded. For example: new or modified equipment may be red; old or existing equipment may be blue; different stages of preparation such as raw material may be green; and, finished product or refuse, another color.

Gans Compressor Station
HG Energy, LLC.
Process Flow Diagram
Monongalia County, WV
February 2017



ATTACHMENT E – PROCESS DESCRIPTION

Provide a detailed written description of the operation for which the applicant is seeking a permit. The process description is used in conjunction with the process flow diagram to provide the reviewing engineer a complete understanding of the activity at the operation. Describe in detail and order the complete process operation.

Use the following guidelines to ensure a complete Process Description:

- The process flow diagram should be prepared first and used as a guide when preparing the process description. The written description shall follow the logical order of the process flow diagram.
- All emission sources, emission points, and air pollution control devices must be included in the process description.
- When modifications are proposed, describe the modifications and the effect the changes will have on the emission sources, emission points, control devices and the potential emissions.
- Proper emission source ID numbers must be used consistently in the process description, the process flow diagram, the emissions calculations, and the emissions summary information provided.
- Include any additional information that may facilitate the reviewers understanding of the process operation.

The process description is required for all sources regardless of whether it is a construction, modification, or administrative update.

Process Description

The natural gas inlet stream from surrounding area wells enters the facility through an inlet suction separator prior to the gas being compressed. After the inlet gas passes through a compressor, it goes through the dehydration process before exiting the facility. The dehydration unit is used to remove water from the gas. In the dehydration process, gas passes through a contactor vessel where water is absorbed by the glycol. The "rich" glycol containing water goes to the glycol reboiler, where heat is used to boil off the water. The heat is supplied by a natural gas-fired reboiler that exhausts to the atmosphere. Flash tank emissions are routed to the reboiler to be used as fuel for 50% destruction efficiency. Overhead still column emissions are routed to a condenser. Condensate, produced water and other pipeline fluids are stored in a storage tank and transported offsite via truck. Emissions from fugitive components also occur.

ATTACHMENT F – PLOT PLAN

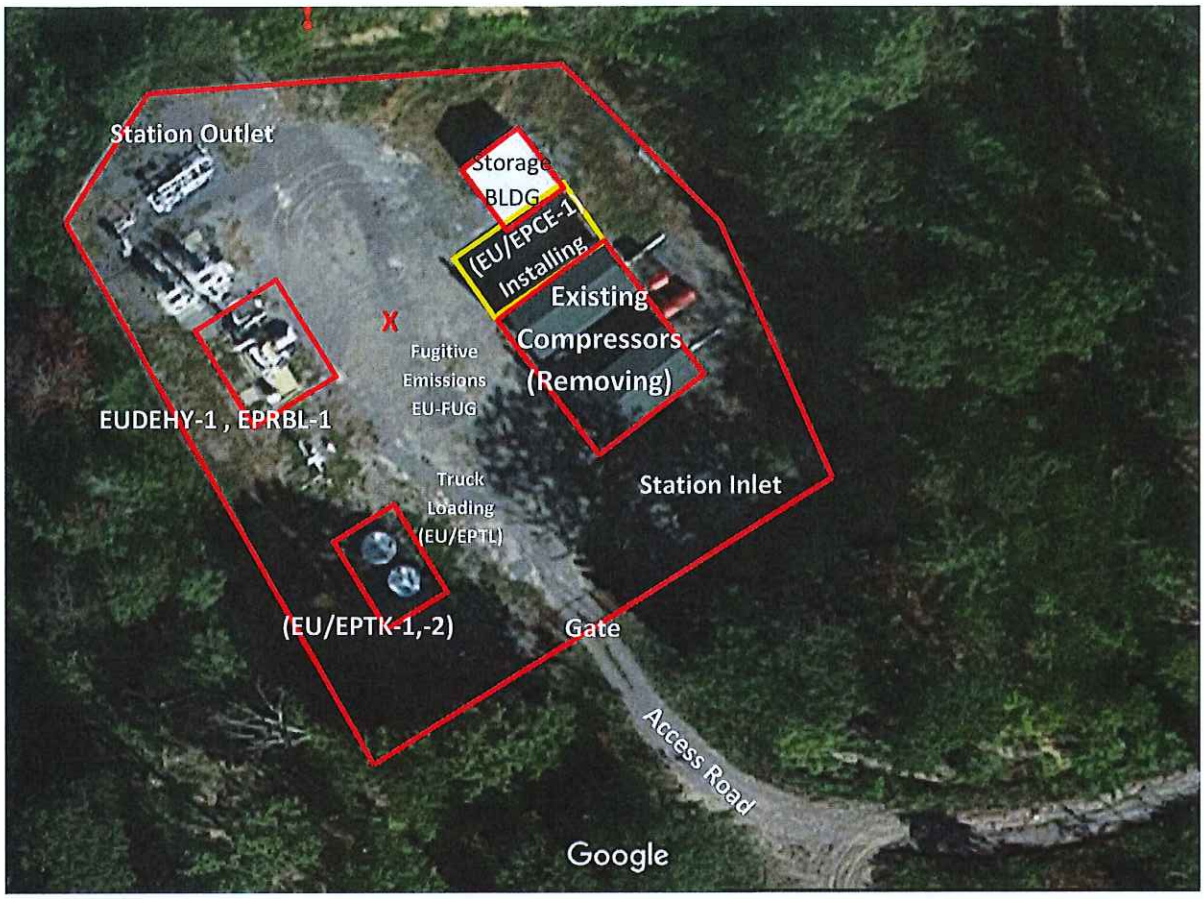
Provide an accurately scaled and detailed Plot Plan showing the locations of all emission units, emission points, and air pollution control devices. Show all emission units, affected facilities, enclosures, buildings and plant entrances and exits from the nearest public road(s) as appropriate. Note height, width and length of proposed or existing buildings and structures.

A scale between 1"=10' and 1"=200' should be used with the determining factor being the level of detail necessary to show operation or plant areas, affected facilities, emission unit sources, transfer points, etc. An overall small scale plot plan (e.g., 1"=300') should be submitted in addition to larger scale plot plans for process or activity areas (e.g., 1"=50') if the plant is too large to allow adequate detail on a single plot plan. Process or activity areas may be grouped for the enlargements as long as sufficient detail is shown.

Use the following guidelines to ensure a complete Plot Plan:

- Facility name
- Company name
- Company facility ID number (for existing facilities)
- Plot scale, north arrow, date drawn, and submittal date.
- Facility boundary lines
- Base elevation
- Lat/Long reference coordinates from the area map and corresponding reference point elevation
- Location of all point sources labeled with proper and consistent source identification numbers

This information is required for all sources regardless of whether it is a construction, modification, or administrative update.



North

Scale: 1" = 25'

Gans Compressor Station

HG Energy, LLC.

Facility ID: 061-00149

Aerial Plot Plan

Monongalia County, WV

February 2017

——— = Facility Boundary

1522' = Base Elevation

X GPS = 39.720265, -79.793483

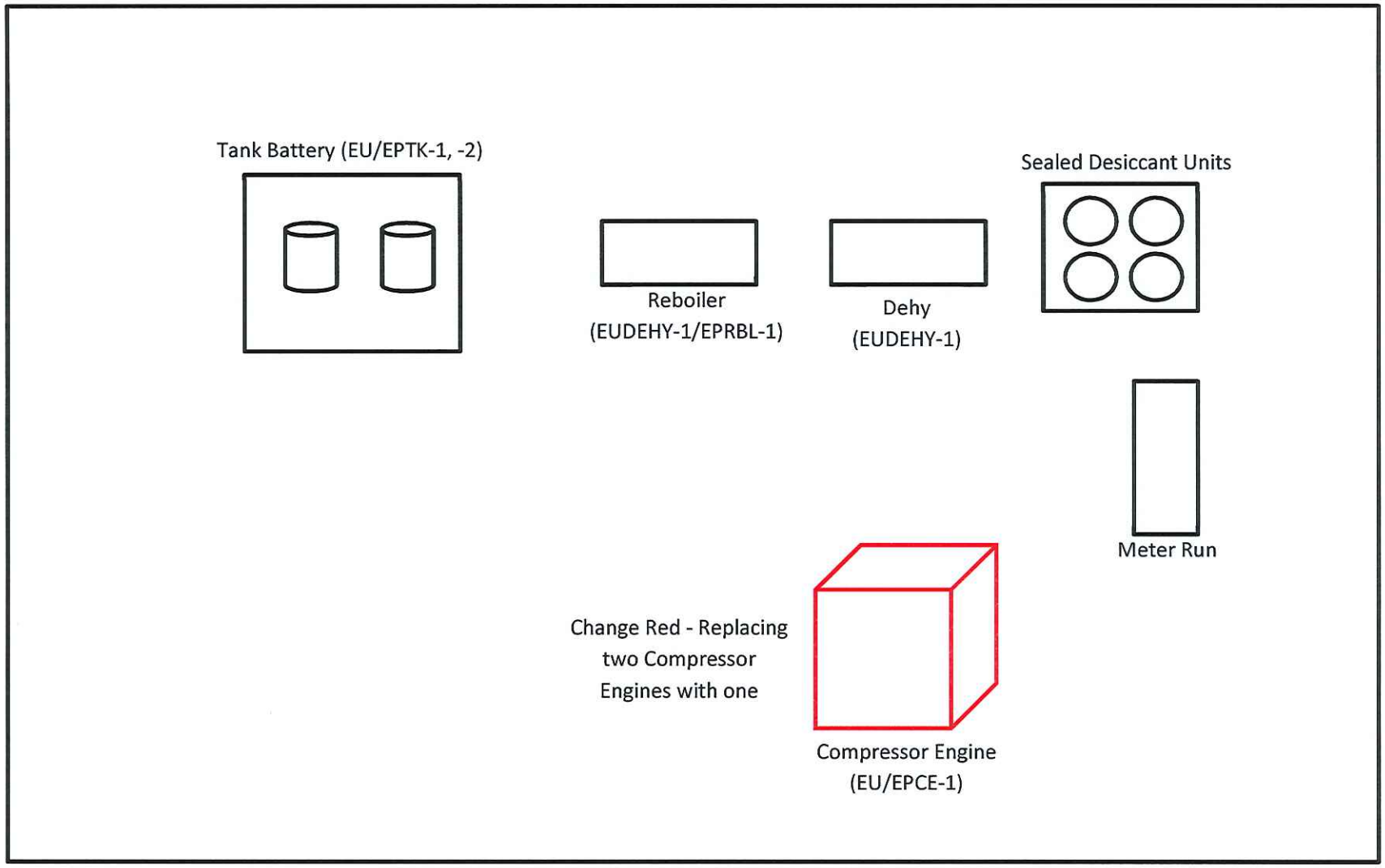
(EU/EPCE-1) = Compressor Engine – NEW INSTALL

(EU/EPTK-1,-2) = Storage Tanks, Double Walled

EUDEHY-1, EPRBL-1 = Dehy and Reboiler

Existing Compressors (to be removed) = Under 2 Buildings, 30'L x 20'W x 20'H

Storage BLDG = 20'L x 20'W x 12'H



Drawing is intended to show relative locations only.
Not to scale

North

Gans Compressor Station
HG Energy, LLC.
Simplified Plot Plan
Monongalia County, WV
February 2017

ATTACHMENT G – AREA MAP

Provide an Area Map showing the current or proposed location of the operation. On this map, identify plant or operation property lines, access roads and any adjacent dwelling, business, public building, school, church, cemetery, community or institutional building or public park within a 300' boundary circle of the collective emission units.

Please provide a 300' boundary circle on the map surrounding the proposed emission units collectively.

This information is required for all sources regardless of whether it is a construction, modification, or administrative update.

Aerial Map Showing the

GANS COMPRESSOR STATION

Coastal Forest Resources Co. Property

Union District, Monongalia County, WV

P/O Tax Map 5, Parcel 1

2/9/2017

ATTACHMENT H – G35-D SECTION APPLICABILITY FORM

General Permit G35-D Registration
Section Applicability Form

General Permit G35-D was developed to allow qualified applicants to seek registration for a variety of sources. These sources include storage vessels, gas production units, in-line heaters, heater treaters, glycol dehydration units and associated reboilers, pneumatic controllers, centrifugal compressors, reciprocating compressors, reciprocating internal combustion engines (RICEs), tank truck loading, fugitive emissions, completion combustion devices, flares, enclosed combustion devices, and vapor recovery systems. All registered facilities will be subject to Sections 1.0, 2.0, 3.0, and 4.0.

General Permit G35-D allows the registrant to choose which sections of the permit they are seeking registration under. Therefore, please mark which additional sections that you are applying for registration under. If the applicant is seeking registration under multiple sections, please select all that apply. Please keep in mind, that if this registration is approved, the issued registration will state which sections will apply to your affected facility.

GENERAL PERMIT G35-D APPLICABLE SECTIONS	
☒ Section 5.0	Storage Vessels Containing Condensate and/or Produced Water[1]
☐ Section 6.0	Storage Vessel Affected Facility (NSPS, Subpart OOOO/OOOOa)
☐ Section 7.0	Control Devices and Emission Reduction Devices not subject to NSPS Subpart OOOO/OOOOa and/or NESHAP Subpart HH
☒ Section 8.0	Small Heaters and Reboilers not subject to 40CFR60 Subpart Dc
☒ Section 9.0	Pneumatic Controllers Affected Facility (NSPS, Subpart OOOO/OOOOa)
☐ Section 10.0	Centrifugal Compressor Affected Facility (NSPS, Subpart OOOO/OOOOa)[2]
☐ Section 11.0	Reciprocating Compressor Affected Facility (NSPS, Subpart OOOO/OOOOa)[2]
☒ Section 12.0	Reciprocating Internal Combustion Engines, Generator Engines. Microturbine Generators
☒ Section 13.0	Tanker Truck Loading[3]
☒ Section 14.0	Glycol Dehydration Units[4]
☒ Section 15.0	Blowdown and Pigging Operations
☒ Section 16.0	Fugitive Emission Components (NSPS, Subpart OOOOa)

1 *Applicants that are subject to Section 5 may also be subject to Section 6 if the applicant is subject to the NSPS, Subpart OOOO/OOOOa control requirements or the applicable control device requirements of Section 7.*

2 *Applicants that are subject to Section 10 and 11 may also be subject to the applicable RICE requirements of Section 12.*

3 *Applicants that are subject to Section 13 may also be subject to control device and emission reduction device requirements of Section 7.*

4 *Applicants that are subject to Section 14 may also be subject to the requirements of Section 8 (reboilers). Applicants that are subject to Section 14 may also be subject to control device and emission reduction device requirements of Section 7.*

ATTACHMENT I – EMISSION UNITS / EMISSION REDUCTION DEVICES (ERD) TABLE

Include ALL emission units and air pollution control devices/ERDs that will be part of this permit application review. Do not include fugitive emission sources in this table. Deminimis storage tanks shall be listed in the Attachment K table. This information is required for all sources regardless of whether it is a construction, modification, or administrative update.

Emission Unit ID[1]	Emission Point ID[2]	Emission Unit Description	Year Installed	Manufac. Date[3]	Design Capacity	Type[4] and Date of Change	Control Device(s)[5]	ERD(s)[6]
CE-1	CE-1	Ajax DPC 2802 LE Engine	2007		384 bhp/440 rpm	Remove 4/1/2017	N/A	N/A
CE-2	CE-2	Ajax DPC 2802 LE Engine	2007		384 bhp/440 rpm	Remove 4/1/2017	N/A	N/A
CE-1	CE-1	630 hp Caterpillar G3508TALE Engine	2017	2/15/2006	630 hp/1,400 rpm	Add 4/1/2017	N/A	N/A
ACE-1	ACE-1	Kohler Command Pro 13 Air Compressor	2014		13 bhp	NO CHANGE	N/A	N/A
DEHY-1	STL-1	TEG Dehydrator Still Vent	2014		6.5 MMscf/d	NO CHANGE	N/A	N/A
DEHY-1	RBL-1	TEG Dehydrator Reboiler	2014		200 MBtu/hr	NO CHANGE	N/A	N/A
TL	TL	Truck Loading	2007		N/A	NO CHANGE	N/A	N/A

[1] For Emission Units (or Sources) use the following numbering system:1S, 2S, 3S,... or other appropriate designation.
[2] For Emission Points use the following numbering system:1E, 2E, 3E, ... or other appropriate designation.
[3] When required by rule
[4] New, modification, removal, existing
[5] For Control Devices use the following numbering system: 1C, 2C, 3C,... or other appropriate designation.
[6] For ERDs use the following numbering system: 1D, 2D, 3D,... or other appropriate designation.

ATTACHMENT J – FUGITIVE EMISSIONS SUMMARY SHEET

Sources of fugitive emissions may include loading operations, equipment leaks, blowdown emissions, etc.
Use extra pages for each associated source or equipment if necessary.

Source/Equipment: fug

Leak Detection Method Used	☐ Audible, visual, and olfactory (AVO) inspections	☒ Infrared (FLIR) cameras	☐ Other (please describe)	☐ None required

Is the facility subject to quarterly LDAR monitoring under 40CFR60 Subpart OOOOa? ☒ Yes ☐ No. If no, why?

Component Type	Closed Vent System	Count	Source of Leak Factors (EPA, other (specify))	Stream type (gas, liquid, etc.)	Estimated Emissions (tpy)		
					VOC	HAP	GHG (CO_2e)
Pumps	☐ Yes ☐ No			☐ Gas ☐ Liquid ☐ Both			
Valves	☐ Yes ☒ No	54	EPA 453/R-95-017, November 1995	☐ Gas ☐ Liquid ☒ Both	0.0028	0	0.2645
Safety Relief Valves	☐ Yes ☒ No	4	EPA 453/R-95-017, November 1995	☐ Gas ☐ Liquid ☒ Both	0.0004	0	0.0290
Open Ended Lines	☐ Yes ☒ No	4	EPA 453/R-95-017, November 1995	☐ Gas ☐ Liquid ☒ Both	0.0001	0	0.0443
Sampling Connections	☐ Yes ☐ No			☐ Gas ☐ Liquid ☐ Both			
Connections (Not sampling)	☐ Yes ☒ No	210	EPA 453/R-95-017, November 1995	☐ Gas ☐ Liquid ☒ Both	0.0009	0	0.1143
Compressors	☐ Yes ☐ No			☐ Gas ☐ Liquid ☐ Both			
Flanges	☐ Yes ☐ No			☐ Gas ☐ Liquid ☐ Both			
Other[1]	☐ Yes ☐ No			☐ Gas ☐ Liquid ☐ Both			

[1] Other equipment types may include compressor seals, relief valves, diaphragms, drains, meters, etc.

Please indicate if there are any closed vent bypasses (include component):
NA

Specify all equipment used in the closed vent system (e.g. VRU, ERD, thief hatches, tanker truck loading, etc.)
NA

ATTACHMENT K – STORAGE VESSEL DATA SHEET

Complete this data sheet if you are the owner or operator of a storage vessel that contains condensate and/or produced water. This form must be completed for ***each*** new or modified bulk liquid storage vessel(s) that contains condensate and/or produced water. (If you have more than one (1) identical tank (i.e. 4-400 bbl condensate tanks), then you can list all on one (1) data sheet). **Include gas sample analysis, flashing emissions, working and breathing losses, USEPA Tanks, simulation software (ProMax, E&P Tanks, HYSYS, etc.), and any other supporting documents where applicable.**

The following information is REQUIRED:

☐ Composition of the representative sample used for the simulation
☐ For each stream that contributes to flashing emissions:
- ☐ Temperature and pressure (inlet and outlet from separator(s))
- ☐ Simulation-predicted composition
- ☐ Molecular weight
- ☐ Flow rate

☐ Resulting flash emission factor or flashing emissions from simulation
☐ Working/breathing loss emissions from tanks and/or loading emissions if simulation is used to quantify those emissions

Additional information may be requested if necessary.

GENERAL INFORMATION

1. Bulk Storage Area Name Gans Compressor Station	2. Tank Name TK1 & TK 2
3. Emission Unit ID number TK1 & TK2	4. Emission Point ID number TK1 & TK2
5. Date Installed , Modified or Relocated *(for existing tanks)* 2007 Was the tank manufactured after August 23, 2011? ☐ Yes ☒ No	6. Type of change: ☐ New construction ☐ New stored material ☒ Other ☐ Relocation
7A. Description of Tank Modification *(if applicable)* No modification; included as first issue of G-35 series minor NSR permit. Note annual throughput of 6,262 gallons brine and 378 gallons oil in 2016; considered de minimis sources	
7B. Will more than one material be stored in this tank? *If so, a separate form must be completed for each material.* ☐ Yes ☒ No	
7C. Was USEPA Tanks simulation software utilized? ☒ Yes ☐ No ***If Yes, please provide the appropriate documentation and items 8-42 below are not required.***	

TANK INFORMATION

8. Design Capacity *(specify barrels or gallons)*. Use the internal cross-sectional area multiplied by internal height.	
9A. Tank Internal Diameter (ft.)	9B. Tank Internal Height (ft.)
10A. Maximum Liquid Height (ft.)	10B. Average Liquid Height (ft.)
11A. Maximum Vapor Space Height (ft.)	11B. Average Vapor Space Height (ft.)
12. Nominal Capacity *(specify barrels or gallons)*. This is also known as "working volume".	
13A. Maximum annual throughput (gal/yr)	13B. Maximum daily throughput (gal/day)
14. Number of tank turnovers per year	15. Maximum tank fill rate (gal/min)
16. Tank fill method ☐ Submerged ☐ Splash ☐ Bottom Loading	
17. Is the tank system a variable vapor space system? ☐ Yes ☐ No If yes, (A) What is the volume expansion capacity of the system (gal)? (B) What are the number of transfers into the system per year?	
18. Type of tank (check all that apply): ☐ Fixed Roof ☐ vertical ☐ horizontal ☐ flat roof ☐ cone roof ☐ dome roof ☐ other (describe) ☐ External Floating Roof ☐ pontoon roof ☐ double deck roof ☐ Domed External (or Covered) Floating Roof ☐ Internal Floating Roof ☐ vertical column support ☐ self-supporting ☐ Variable Vapor Space ☐ lifter roof ☐ diaphragm ☐ Pressurized ☐ spherical ☐ cylindrical ☐ Other (describe)	

PRESSURE/VACUUM CONTROL DATA

19. Check as many as apply:

☐ Does Not Apply ☐ Rupture Disc (psig)

☐ Inert Gas Blanket of _____ ☐ Carbon Adsorption[1]

☐ Vent to Vapor Combustion Device[1] (vapor combustors, flares, thermal oxidizers, enclosed combustors)

☐ Conservation Vent (psig) ☐ Condenser[1]

Vacuum Setting Pressure Setting

☐ Emergency Relief Valve (psig)

Vacuum Setting Pressure Setting

☐ Thief Hatch Weighted ☐ Yes ☐ No

[1] Complete appropriate Air Pollution Control Device Sheet

20. Expected Emission Rate (submit Test Data or Calculations here or elsewhere in the application).

Material Name	Flashing Loss		Breathing Loss		Working Loss		Total Emissions Loss		Estimation Method[1]
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	

[1] EPA = EPA Emission Factor, MB = Material Balance, SS = Similar Source, ST = Similar Source Test, Throughput Data, O = Other (specify)
Remember to attach emissions calculations, including TANKS Summary Sheets and other modeling summary sheets if applicable.

TANK CONSTRUCTION AND OPERATION INFORMATION		
21. Tank Shell Construction: ☐ Riveted ☐ Gunite lined ☐ Epoxy-coated rivets ☐ Other (describe)		
21A. Shell Color:	21B. Roof Color:	21C. Year Last Painted:
22. Shell Condition (if metal and unlined): ☐ No Rust ☐ Light Rust ☐ Dense Rust ☐ Not applicable		
22A. Is the tank heated? ☐ Yes ☐ No	22B. If yes, operating temperature:	22C. If yes, how is heat provided to tank?
23. Operating Pressure Range (psig): **Must be listed for tanks using VRUs with closed vent system.**		
24. Is the tank a **Vertical Fixed Roof Tank?** ☐ Yes ☐ No	24A. If yes, for dome roof provide radius (ft):	24B. If yes, for cone roof, provide slop (ft/ft):
25. Complete item 25 for **Floating Roof Tanks** ☐ Does not apply ☐		
25A. Year Internal Floaters Installed:		
25B. Primary Seal Type *(check one)*: ☐ Metallic (mechanical) shoe seal ☐ Liquid mounted resilient seal ☐ Vapor mounted resilient seal ☐ Other (describe):		
25C. Is the Floating Roof equipped with a secondary seal? ☐ Yes ☐ No		
25D. If yes, how is the secondary seal mounted? *(check one)* ☐ Shoe ☐ Rim ☐ Other (describe):		
25E. Is the floating roof equipped with a weather shield? ☐ Yes ☐ No		
25F. Describe deck fittings:		
26. Complete the following section for **Internal Floating Roof Tanks** ☐ Does not apply		
26A. Deck Type: ☐ Bolted ☐ Welded	26B. For bolted decks, provide deck construction:	
26C. Deck seam. Continuous sheet construction: ☐ 5 ft. wide ☐ 6 ft. wide ☐ 7 ft. wide ☐ 5 x 7.5 ft. wide ☐ 5 x 12 ft. wide ☐ other (describe)		
26D. Deck seam length (ft.):	26E. Area of deck (ft^2):	26F. For column supported tanks, # of columns:	26G. For column supported tanks, diameter of column:
27. Closed Vent System with VRU? ☐ Yes ☐ No		
28. Closed Vent System with Enclosed Combustor? ☐ Yes ☐ No		
SITE INFORMATION		
29. Provide the city and state on which the data in this section are based:		
30. Daily Avg. Ambient Temperature (°F):	31. Annual Avg. Maximum Temperature (°F):	
32. Annual Avg. Minimum Temperature (°F):	33. Avg. Wind Speed (mph):	
34. Annual Avg. Solar Insulation Factor (BTU/ft^2-day):	35. Atmospheric Pressure (psia):	
LIQUID INFORMATION		
36. Avg. daily temperature range of bulk liquid (°F):	36A. Minimum (°F):	36B. Maximum (°F):
37. Avg. operating pressure range of tank (psig):	37A. Minimum (psig):	37B. Maximum (psig):
38A. Minimum liquid surface temperature (°F):	38B. Corresponding vapor pressure (psia):	
39A. Avg. liquid surface temperature (°F):	39B. Corresponding vapor pressure (psia):	
40A. Maximum liquid surface temperature (°F):	40B. Corresponding vapor pressure (psia):	
41. Provide the following for each liquid or gas to be stored in the tank. Add additional pages if necessary.		
41A. Material name and composition:			
41B. CAS number:			
41C. Liquid density (lb/gal):			
41D. Liquid molecular weight (lb/lb-mole):			

41E. Vapor molecular weight (lb/lb-mole):			
41F. Maximum true vapor pressure (psia):			
41G. Maximum Reid vapor pressure (psia):			
41H. Months Storage per year. From: To:			
42. Final maximum gauge pressure and temperature prior to transfer into tank used as inputs into flashing emission calculations.			

STORAGE TANK DATA TABLE

List all deminimis storage tanks (i.e. lube oil, glycol, diesel etc.)

Source ID #[1]	Status[2]	Content[3]	Volume[4]
TK1	EXIST	Brine/Pipeline Fluids	2,100
TK2	EXIST	Brine/Pipeline Fluids	2,100

1. Enter the appropriate Source Identification Numbers (Source ID #) for each storage tank located at the compressor station. Tanks should be designated T01, T02, T03, etc.
2. Enter storage tank Status using the following:
   - EXIST Existing Equipment
   - NEW Installation of New Equipment
   - REM Equipment Removed
3. Enter storage tank content such as condensate, pipeline liquids, glycol (DEG or TEG), lube oil, diesel, mercaptan etc.
4. Enter the maximum design storage tank volume in gallons.

ATTACHMENT L – SMALL HEATERS AND REBOILERS NOT SUBJECT TO 40CFR60 SUBPART DC DATA SHEET

Complete this data sheet for each small heater and reboiler not subject to 40CFR60 Subpart Dc at the facility. ***The Maximum Design Heat Input (MDHI) must be less than 10 MMBTU/hr.***

Emission Unit ID#[1]	Emission Point ID#[2]	Emission Unit Description (manufacturer, model #)	Year Installed/ Modified	Type[3] and Date of Change	Maximum Design Heat Input (MMBTU/hr)[4]	Fuel Heating Value (BTU/scf)[5]
DHY1	RBL1	TEG Dehydrator Reboiler	2015	NO CHANGE	0.200	1,020

1 Enter the appropriate Emission Unit (or Source) identification number for each fuel burning unit located at the production pad. Gas Producing Unit Burners should be designated GPU-1, GPU-2, etc. Heater Treaters should be designated HT-1, HT-2, etc. Heaters or Line Heaters should be designated LH-1, LH-2, etc. For sources, use 1S, 2S, 3S…or other appropriate designation. Enter glycol dehydration unit Reboiler Vent data on the Glycol Dehydration Unit Data Sheet.

2 Enter the appropriate Emission Point identification numbers for each fuel burning unit located at the production pad. Gas Producing Unit Burners should be designated GPU-1, GPU-2, etc. Heater Treaters should be designated HT-1, HT-2, etc. Heaters or Line Heaters should be designated LH-1, LH-2, etc. For emission points, use 1E, 2E, 3E…or other appropriate designation.

3 New, modification, removal

4 Enter design heat input capacity in MMBtu/hr.

5 Enter the fuel heating value in BTU/standard cubic foot.

ATTACHMENT M – INTERNAL COMBUSTION ENGINE DATA SHEET

Complete this data sheet for each internal combustion engine at the facility. Include manufacturer performance data sheet(s) or any other supporting document if applicable. Use extra pages if necessary. *Generator(s) and microturbine generator(s) shall also use this form.*

Emission Unit ID#[1]	CE-1	CE-1	CE-2
Engine Manufacturer/Model	Caterpillar G3508TALE	AJAX 2802LE	AJAX 2802LE
Manufacturers Rated bhp/rpm	630/1,400	384 bhp/440 rpm	384 bhp/440 rpm
Source Status[2]	NS	REM	REM
Date Installed/ Modified/Removed/Relocated[3]	4/1/2017	4/1/2017	4/1/2017
Engine Manufactured /Reconstruction Date[4]	2/15/2006/N/A	N/A / N/A	N/A / N/A
Check all applicable Federal Rules for the engine (include EPA Certificate of Conformity if applicable)[5]	☐40CFR60 Subpart JJJJ ☐JJJJ Certified? ☐40CFR60 Subpart IIII ☐IIII Certified? ☒40CFR63 Subpart ZZZZ ☐ NESHAP ZZZZ/ NSPS JJJJ Window ☐ NESHAP ZZZZ Remote Sources	☐40CFR60 Subpart JJJJ ☐JJJJ Certified? ☐40CFR60 Subpart IIII ☐IIII Certified? ☒40CFR63 Subpart ZZZZ ☐ NESHAP ZZZZ/ NSPS JJJJ Window ☐ NESHAP ZZZZ Remote Sources	☐40CFR60 Subpart JJJJ ☐JJJJ Certified? ☐40CFR60 Subpart IIII ☐IIII Certified? ☒40CFR63 Subpart ZZZZ ☐ NESHAP ZZZZ/ NSPS JJJJ Window ☐ NESHAP ZZZZ Remote Sources
Engine Type[6]	4SLB	2SLB	2SLB
APCD Type[7]	NA	NA	NA
Fuel Type[8]	PQ	PQ	PQ
H_2S (gr/100 scf)	NEG	NEG	NEG
Operating bhp/rpm	630/1,400	NA	NA
BSFC (BTU/bhp-hr)	8533	NA	NA
Hourly Fuel Throughput	5,270 ft^3/hr gal/hr	ft^3/hr gal/hr	ft^3/hr gal/hr
Annual Fuel Throughput (Must use 8,760 hrs/yr unless emergency generator)	46.28 $MMft^3/yr$ gal/yr	$MMft^3/yr$ gal/yr	$MMft^3/yr$ gal/yr
Fuel Usage or Hours of Operation Metered	Yes ☒ No ☐	Yes ☐ No ☐	Yes ☐ No ☐

Calculation Methodology[9]	Pollutant[10]	Hourly PTE (lb/hr)[11]	Annual PTE (tons/year)[11]	Hourly PTE (lb/hr)[11]	Annual PTE (tons/year)[11]	Hourly PTE (lb/hr)[11]	Annual PTE (tons/year)[11]
MD	NO_x	2.7785	12.168	1.95	8.54	1.95	8.54
MD	CO	2.222	9.732	1.17	5.12	1.17	5.12
MD	VOC	0.389	1.704	1.17	5.12	1.17	5.12
MD	SO_2	0.0032	0.0138	0.01	0.04	0.01	0.04
MD	PM_{10}	0.0537	0.2352	0.03	0.13	0.03	0.13
MD	Formaldehyde	0.347	1.52	0.29	1.28	0.29	1.28
AP, MD	Total HAPs	0.45	1.519	0.35	1.57	0.35	1.57
MD	GHG (CO_2e)	775.358	3396.068	359.72	1,575.57	359.72	1,575.57

ATTACHMENT M – INTERNAL COMBUSTION ENGINE DATA SHEET

Complete this data sheet for each internal combustion engine at the facility. Include manufacturer performance data sheet(s) or any other supporting document if applicable. Use extra pages if necessary. *Generator(s) and microturbine generator(s) shall also use this form.*

Emission Unit ID#[1]	ACE1		
Engine Manufacturer/Model	Kohler		
Manufacturers Rated bhp/rpm	13		
Source Status[2]	ES		
Date Installed/ Modified/Removed/Relocated[3]	2014 / N/A		
Engine Manufactured /Reconstruction Date[4]	N/A / N.A		
Check all applicable Federal Rules for the engine (include EPA Certificate of Conformity if applicable)[5]	☒40CFR60 Subpart JJJJ ☐JJJJ Certified? ☐40CFR60 Subpart IIII ☐IIII Certified? ☐40CFR63 Subpart ZZZZ ☐ NESHAP ZZZZ/ NSPS JJJJ Window ☐ NESHAP ZZZZ Remote Sources	☐40CFR60 Subpart JJJJ ☐JJJJ Certified? ☐40CFR60 Subpart IIII ☐IIII Certified? ☐40CFR63 Subpart ZZZZ ☐ NESHAP ZZZZ/ NSPS JJJJ Window ☐ NESHAP ZZZZ Remote Sources	☐40CFR60 Subpart JJJJ ☐JJJJ Certified? ☐40CFR60 Subpart IIII ☐IIII Certified? ☐40CFR63 Subpart ZZZZ ☐ NESHAP ZZZZ/ NSPS JJJJ Window ☐ NESHAP ZZZZ Remote Sources
Engine Type[6]	Gasoline		
APCD Type[7]	NA		
Fuel Type[8]	PQ		
H_2S (gr/100 scf)	NEG		
Operating bhp/rpm	13		
BSFC (BTU/bhp-hr)	7,000		
Hourly Fuel Throughput	0.7 ft^3/hr gal/hr	ft^3/hr gal/hr	ft^3/hr gal/hr
Annual Fuel Throughput (Must use 8,760 hrs/yr unless emergency generator)	1,400 MMft^3/yr gal/yr	MMft^3/yr gal/yr	MMft^3/yr gal/yr
Fuel Usage or Hours of Operation Metered	Yes ☐ No ☐	Yes ☐ No ☐	Yes ☐ No ☐

Calculation Methodology[9]	Pollutant[10]	Hourly PTE (lb/hr)[11]	Annual PTE (tons/year)[11]	Hourly PTE (lb/hr)[11]	Annual PTE (tons/year)[11]	Hourly PTE (lb/hr)[11]	Annual PTE (tons/year)[11]
MD	NO_x	0.19	0.19				
MD	CO	7.85	7.85				
MD	VOC	0.19	0.19				
MD	SO_2	0.01	0.01				
MD	PM_{10}	0.01	0.01				
MD	Formaldehyde	0.01	0.01				
AP	Total HAPs	0.01	0.01				
MD	GHG (CO_2e)	14.14	14.14				

1 Enter the appropriate Source Identification Number for each natural gas-fueled reciprocating internal combustion compressor/generator engine located at the compressor station. Multiple compressor engines should be designated CE-1, CE-2, CE-3 etc. Generator engines should be designated GE-1, GE-2, GE-3 etc. Microturbine generator engines should be designated MT-1, MT-2, MT-3 etc. If more than three (3) engines exist, please use additional sheets.

2 Enter the Source Status using the following codes:

NS	Construction of New Source (installation)	ES	Existing Source
MS	Modification of Existing Source	RS	Relocated Source
REM	Removal of Source		

3 Enter the date (or anticipated date) of the engine's installation (construction of source), modification, relocation or removal.

4 Enter the date that the engine was manufactured, modified or reconstructed.

5 Is the engine a certified stationary spark ignition internal combustion engine according to 40CFR60 Subpart IIII/JJJJ? If so, the engine and control device must be operated and maintained in accordance with the manufacturer's emission-related written instructions. You must keep records of conducted maintenance to demonstrate compliance, but no performance testing is required. If the certified engine is not operated and maintained in accordance with the manufacturer's emission-related written instructions, the engine will be considered a non-certified engine and you must demonstrate compliance as appropriate.

Provide a manufacturer's data sheet for all engines being registered.

6 Enter the Engine Type designation(s) using the following codes:

2SLB	Two Stroke Lean Burn	4SRB	Four Stroke Rich Burn
4SLB	Four Stroke Lean Burn		

7 Enter the Air Pollution Control Device (APCD) type designation(s) using the following codes:

A/F	Air/Fuel Ratio	IR	Ignition Retard
HEIS	High Energy Ignition System	SIPC	Screw-in Precombustion Chambers
PSC	Prestratified Charge	LEC	Low Emission Combustion
NSCR	Rich Burn & Non-Selective Catalytic Reduction	OxCat	Oxidation Catalyst
SCR	Lean Burn & Selective Catalytic Reduction		

8 Enter the Fuel Type using the following codes:

PQ	Pipeline Quality Natural Gas	RG	Raw Natural Gas /Production Gas	D	Diesel

9 Enter the Potential Emissions Data Reference designation using the following codes. Attach all reference data used.

MD	Manufacturer's Data	AP	AP-42	
GR	GRI-HAPCalc™	OT	Other	(please list)

10 Enter each engine's Potential to Emit (PTE) for the listed regulated pollutants in pounds per hour and tons per year. PTE shall be calculated at manufacturer's rated brake horsepower and may reflect reduction efficiencies of listed Air Pollution Control Devices. Emergency generator engines may use 500 hours of operation when calculating PTE. PTE data from this data sheet shall be incorporated in the *Emissions Summary Sheet*.

11 PTE for engines shall be calculated from manufacturer's data unless unavailable.

Engine Air Pollution Control Device
(Emission Unit ID# , use extra pages as necessary)

Air Pollution Control Device Manufacturer's Data Sheet included?
Yes ☐ No ☐

☐ NSCR ☐ SCR ☐ Oxidation Catalyst

Provide details of process control used for proper mixing/control of reducing agent with gas stream:

Manufacturer:	Model #:
Design Operating Temperature: °F	Design gas volume: scfm
Service life of catalyst:	Provide manufacturer data? ☐Yes ☐ No
Volume of gas handled: acfm at °F	Operating temperature range for NSCR/Ox Cat: From °F to °F
Reducing agent used, if any:	Ammonia slip (ppm):
Pressure drop against catalyst bed (delta P): inches of H_2O	

Provide description of warning/alarm system that protects unit when operation is not meeting design conditions:

Is temperature and pressure drop of catalyst required to be monitored per 40CFR63 Subpart ZZZZ?
☐ Yes ☐ No

How often is catalyst recommended or required to be replaced (hours of operation)?

How often is performance test required?
☐ Initial
☐ Annual
☐ Every 8,760 hours of operation
☐ Field Testing Required
☐ No performance test required. If so, why (please list any maintenance required and the applicable sections in NSPS/GACT,

ATTACHMENT N – TANKER TRUCK LOADING DATA SHEET

Complete this data sheet for each new or modified bulk liquid transfer area or loading rack at the facility. This is to be used for bulk liquid transfer operations to tanker trucks. Use extra pages if necessary.

Truck Loadout Collection Efficiencies

The following applicable capture efficiencies of a truck loadout are allowed:

- For tanker trucks passing the MACT level annual leak test – 99.2%
- For tanker trucks passing the NSPS level annual leak test – 98.7%
- For tanker trucks not passing one of the annual leak tests listed above – 70%

Compliance with this requirement shall be demonstrated by keeping records of the applicable MACT or NSPS Annual Leak Test certification for ***every*** truck and railcar loaded/unloaded. This requirement can be satisfied if the trucking company provided certification that its entire fleet was compliant. This certification must be submitted in writing to the Director of the DAQ. These additional requirements must be noted in the Registration Application and will be noted on the issued G35-D Registration.

Emission Unit ID#: TL	Emission Point ID#: TL	Year Installed/Modified: 2007
Emission Unit Description: Truck loading of brine/pipeline fluids		
Loading Area Data		
Number of Pumps: 1	Number of Liquids Loaded: 2	Max number of trucks loading at one (1) time: 1
Are tanker trucks pressure tested for leaks at this or any other location? ☐ Yes ☐ No ☒ Not Required If Yes, Please describe:		
Provide description of closed vent system and any bypasses. NA		
Are any of the following truck loadout systems utilized? ☐ Closed System to tanker truck passing a MACT level annual leak test? ☐ Closed System to tanker truck passing a NSPS level annual leak test? ☐ Closed System to tanker truck not passing an annual leak test and has vapor return?		

Projected Maximum Operating Schedule (for rack or transfer point as a whole)

Time	Jan – Mar	Apr - Jun	Jul – Sept	Oct - Dec
Hours/day	Load out ~ 2X per year			
Days/week	Load out ~ 2X per year			

Bulk Liquid Data (use extra pages as necessary)

Liquid Name	Brine	Pipeline fluids	
Max. Daily Throughput (1000 gal/day)	3.131	0.1895	
Max. Annual Throughput (1000 gal/yr)	6.262	0.379	
Loading Method[1]	SP	SP	
Max. Fill Rate (gal/min)	70	70	
Average Fill Time (min/loading)	60	60	
Max. Bulk Liquid Temperature (°F)	70	70	
True Vapor Pressure[2]	4.3	4.3	
Cargo Vessel Condition[3]	U	U	
Control Equipment or Method[4]	NONE	NONE	

Max. Collection Efficiency (%)		0	0	
Max. Control Efficiency (%)		0	0	
Max.VOC Emission Rate	Loading (lb/hr)	0.000068	0.000068	
	Annual (ton/yr)	0.0003	0.0003	
Max.HAP Emission Rate	Loading (lb/hr)	0.0000006	0.0000006	
	Annual (ton/yr)	0.000003	0.000003	
Estimation Method[5]		EPA	EPA	

1 BF Bottom Fill SP Splash Fill SUB Submerged Fill

2 At maximum bulk liquid temperature

3 B Ballasted Vessel C Cleaned U Uncleaned (dedicated service)
O Other (describe)

4 List as many as apply (complete and submit appropriate Air Pollution Control Device Sheets)
CA Carbon Adsorption VB Dedicated Vapor Balance (closed system)
ECD Enclosed Combustion Device F Flare
TO Thermal Oxidization or Incineration

5 EPA EPA Emission Factor in AP-42 MB Material Balance
TM Test Measurement based upon test data submittal O Other (describe)

ATTACHMENT O – GLYCOL DEHYDRATION UNIT DATA SHEET

Complete this data sheet for each Glycol Dehydration Unit, Reboiler, Flash Tank and/or Regenerator at the facility. Include gas sample analysis and GRI- GLYCalc™ input and aggregate report. Use extra pages if necessary.

Manufacturer:	Model:
Max. Dry Gas Flow Rate: 6.5 mmscf/day	Reboiler Design Heat Input: 0.200 MMBTU/hr
Design Type: ☒ TEG ☐ DEG ☐ EG	Source Status[1]: ES
Date Installed/Modified/Removed[2]: 2015	Regenerator Still Vent APCD/ERD[3]: NA
Control Device/ERD ID#[3]: NA	Fuel HV (BTU/scf): 1,020
H_2S Content (gr/100 scf): NEG	Operation (hours/year): 8,760
Pump Rate (scfm):	
Water Content (wt %) in: Wet Gas: SAT Dry Gas: 7%	

Is the glycol dehydration unit exempt from 40CFR63 Section 764(d)? X Yes ☐ No: If Yes, answer the following:

The actual annual average flowrate of natural gas to the glycol dehydration unit is less than 85 thousand standard cubic meters per day, as determined by the procedures specified in §63.772(b)(1) of this subpart. ☐ Yes X No

The actual average emissions of benzene from the glycol dehydration unit process vent to the atmosphere are less than 0.90 megagram per year (1 ton per year), as determined by the procedures specified in §63.772(b)(2) of this subpart. X Yes ☐ No

Is the glycol dehydration unit located within an Urbanized Area (UA) or Urban Cluster (UC)? ☐ Yes X No

Is a lean glycol pump optimization plan being utilized? ☐ Yes X No

Recycling the glycol dehydration unit back to the flame zone of the reboiler.
☒ Yes ☐ No
If yes:
Is the reboiler configured to accept flash drum vapors (straight from the glycol dehydrator)? ☒ Yes ☐ No
Is the reboiler configured to accept still vent vapors (after a condenser)? ☐ Yes ☒ No
Is the reboiler configured to accept both in the same operation? ☐ Yes ☒ No

Recycling the glycol dehydration unit back to the flame zone of the reboiler and mixed with fuel.
☒ Yes ☐ No

What happens when temperature controller shuts off fuel to the reboiler?
☐ Still vent emissions to the atmosphere.
☐ Still vent emissions stopped with valve.
☐ Still vent emissions to glow plug.

Please indicate if the following equipment is present.
☐ Flash Tank
☐ Burner management system that continuously burns condenser or flash tank vapors

Control Device Technical Data

Pollutants Controlled	Manufacturer's Guaranteed Control Efficiency (%)
NA	NA

Emissions Data

Emission Unit ID / Emission Point ID[4]	Description	Calculation Methodology[5]	PTE[6]	Controlled Maximum Hourly Emissions (lb/hr)	Controlled Maximum Annual Emissions (tpy)
RBL1	Reboiler Vent	AP	NO_x	0.019608	0.08588
		AP	CO	0.016471	0.07214
		AP	VOC	0.001078	0.00472
		AP	SO_2	0.000118	0.00052

		AP	PM_{10}	0.001490	0.00653
		AP	GHG (CO_2e)	23.529400	103.67118
STL1	Glycol Regenerator Still Vent	GRI-GlyCalc™	VOC	0.0661	0.28592
		GRI-GlyCalc™	Benzene	0.0034	0.0149
		GRI-GlyCalc™	Toluene	0.0049	0.0215
		GRI-GlyCalc™	Ethylbenzene	0.0056	0.0247
		GRI-GlyCalc™	Xylenes	0.0069	0.0301
		GRI-GlyCalc™	n-Hexane	0.0001	0.0004
FT1	Glycol Flash Tank	GRI-GlyCalc™	VOC	0	0
		GRI-GlyCalc™	Benzene	0	0
		GRI-GlyCalc™	Toluene	0	0
		GRI-GlyCalc™	Ethylbenzene	0	0
		GRI-GlyCalc™	Xylenes	0	0
		GRI-GlyCalc™	n-Hexane	0	0

1 Enter the Source Status using the following codes:
NS Construction of New Source ES Existing Source
MS Modification of Existing Source

2 Enter the date (or anticipated date) of the glycol dehydration unit's installation (construction of source), modification or removal.

3 Enter the Air Pollution Control Device (APCD)/Emission Reduction Device (ERD) type designation using the following codes and the device ID number:
NA None CD Condenser FL Flare
CC Condenser/Combustion Combination TO Thermal Oxidizer O Other (please list)

4 Enter the appropriate Emission Unit ID Numbers and Emission Point ID Numbers for the glycol dehydration unit reboiler vent and glycol regenerator still vent. The glycol dehydration unit reboiler vent and glycol regenerator still vent should be designated RBV-1 and RSV-1, respectively. If the compressor station incorporates multiple glycol dehydration units, a Glycol Dehydration Emission Unit Data Sheet shall be completed for each, using Source Identification RBV-2 and RSV-2, RBV-3 and RSV-3, etc.

5 Enter the Potential Emissions Data Reference designation using the following codes:
MD Manufacturer's Data AP AP-42
GR GRI-GLYCalc™ OT Other (please list)

6 Enter the Reboiler Vent and Glycol Regenerator Still Vent Potential to Emit (PTE) for the listed regulated pollutants in lbs per hour and tons per year. The Glycol Regenerator Still Vent potential emissions may be determined using the most recent version of the thermodynamic software model GRI-GLYCalc™ (Radian International LLC & Gas Research Institute). **Attach all referenced Potential Emissions Data (or calculations) and the GRI-GLYCalc™ Aggregate Calculations Report (shall include emissions reports, equipment reports, and stream reports) to this Glycol Dehydration Emission Unit Data Sheet(s). Backup pumps do not have to be considered as operating for purposes of PTE.** This PTE data shall be incorporated in the Emissions Summary Sheet.

ATTACHMENT P – PNEUMATIC CONTROLLERS DATA SHEET

Are there any continuous bleed natural gas driven pneumatic controllers at this facility that commenced construction, modification or reconstruction after August 23, 2011, and on or before September 18, 2015?

☐ Yes ☒ No

Please list approximate number.

Are there any continuous bleed natural gas driven pneumatic controllers at this facility that commenced construction, modification or reconstruction after September 18, 2015?

☐ Yes ☒ No

Please list approximate number.

Are there any continuous bleed natural gas driven pneumatic controllers at this facility with a bleed rate greater than 6 standard cubic feet per hour that are required based on functional needs, including but not limited to response time, safety and positive actuation that commenced construction, modification or reconstruction after August 23, 2011, and on or before September 18, 2015?

☐ Yes ☒ No

Please list approximate number.

Are there any continuous bleed natural gas driven pneumatic controllers at this facility with a bleed rate greater than 6 standard cubic feet per hour that are required based on functional needs, including but not limited to response time, safety and positive actuation that commenced construction, modification or reconstruction after September 18, 2015?

☐ Yes ☒ No

Please list approximate number.

ATTACHMENT Q – CENTRIFUGAL COMPRESSOR DATA SHEET

Are there any centrifugal compressors at this facility that commenced construction, modification or reconstruction after August 23, 2011, and on or before September 18, 2015?

☐ Yes ☒ No

Please list:

Emission Unit ID#	Compressor Description

Are there any centrifugal compressors at this facility that commenced construction, modification or reconstruction after September 18, 2015?

☐ Yes ☒ No

Please list:

Emission Unit ID#	Compressor Description

ATTACHMENT R – RECIPROCATING COMPRESSOR DATA SHEET

Are there any reciprocating compressors at this facility that commenced construction, modification or reconstruction after August 23, 2011, and on or before September 18, 2015?

☐ Yes ☒ No

Please list:

Emission Unit ID#	Compressor Description

Are there any reciprocating compressors at this facility that commenced construction, modification or reconstruction after September 18, 2015?

☐ Yes ☒ No

Please list:

Emission Unit ID#	Compressor Description

ATTACHMENT S – BLOWDOWN AND PIGGING OPERATIONS DATA SHEET

Will there be any blowdown and pigging operations that occur at this facility?

☒ Yes ☐ No

Please list:

Type of Event	# of Events (event/yr)	Amount Vented per event (scf/event)	MW of vented gas (lb/lb-mol)	Total Emissions (ton/yr)	VOC weight fraction	VOC emissions (ton/yr)
Compressor Blowdown	12	586	16.44	0.1525	0.12	0.00018
Compressor Startup	12	586	16.44	0.1525	0.12	0.00018
Plant Shutdown						
Low Pressure Pig Venting						
High Pressure Pig Venting						

Type of Event	# of Events (event/yr)	Amount Vented per event (scf/event)	MW of vented gas (lb/lb-mol)	Total Emissions (ton/yr)	HAP weight fraction	HAP emissions (ton/yr)
Compressor Blowdown	12	586	16.44	0.1525	0.0	0
Compressor Startup	12	586	16.44	0.1525	0.0	0
Plant Shutdown						
Low Pressure Pig Venting						
High Pressure Pig Venting						

ATTACHMENT T – AIR POLLUTION CONTROL DEVICE / EMISSION REDUCTION DEVICE SHEETS

Complete the applicable air pollution control device sheets for each flare, vapor combustor, thermal oxidizer, condenser, adsorption system, vapor recovery unit, BTEX Eliminator, Reboiler with and without Glow Plug, etc. at the facility. Use extra pages if necessary.

Emissions calculations must be performed using the most conservative control device efficiency.

The following five (5) rows are only to be completed if registering an alternative air pollution control device.	
Emission Unit ID:	Make/Model:
Primary Control Device ID:	Make/Model:
Control Efficiency (%):	APCD/ERD Data Sheet Completed: ☐ Yes ☐ No
Secondary Control Device ID:	Make/Model:
Control Efficiency (%):	APCD/ERD Data Sheet Completed: ☐ Yes ☐ No

VAPOR COMBUSTION
(Including Enclosed Combustors)

General Information

Control Device ID#:	Installation Date: ☐ New ☐ Modified ☐ Relocated	
Maximum Rated Total Flow Capacity scfh scfd	Maximum Design Heat Input (from mfg. spec sheet) MMBTU/hr	Design Heat Content BTU/scf

Control Device Information

Type of Vapor Combustion Control?

☐ Enclosed Combustion Device ☐ Elevated Flare ☐ Ground Flare
☐ Thermal Oxidizer

Manufacturer: Model:	Hours of operation per year?

List the emission units whose emissions are controlled by this vapor control device (Emission Point ID#)

Emission Unit ID#	Emission Source Description	Emission Unit ID#	Emission Source Description

If this vapor combustor controls emissions from more than six (6) emission units, please attach additional pages.

Assist Type (Flares only)	Flare Height	Tip Diameter	Was the design per §60.18?
☐ Steam ☐ Air ☐ Pressure ☐ Non	feet	feet	☐ Yes ☐ No Provide determination.

Waste Gas Information

Maximum Waste Gas Flow Rate (scfm)	Heat Value of Waste Gas Stream BTU/ft^3	Exit Velocity of the Emissions Stream (ft/s)

Provide an attachment with the characteristics of the waste gas stream to be burned.

Pilot Gas Information

Number of Pilot Lights	Fuel Flow Rate to Pilot Flame per Pilot scfh	Heat Input per Pilot BTU/hr	Will automatic re-ignition be used? ☐ Yes ☐ No

If automatic re-ignition is used, please describe the method.

Is pilot flame equipped with a monitor to detect the presence of the flame? ☐ Yes ☐ No	If Yes, what type? ☐ Thermocouple ☐ Infrared ☐ Ultraviolet ☐ Camera ☐ Other:

Describe all operating ranges and maintenance procedures required by the manufacturer to maintain the warranty. *(If unavailable, please indicate).*

Additional information attached? ☐ Yes ☐ No
Please attach copies of manufacturer's data sheets, drawings, flame demonstration per §60.18 or §63.11(b) and performance testing.

CONDENSER		
General Information		
Control Device ID#:	Installation Date: ☐ New ☐ Modified ☐ Relocated	
Manufacturer:	Model:	Control Device Name:
Control Efficiency (%):		
Manufacturer's required temperature range for control efficiency. °F		
Describe the warning and/or alarm system that protects against operation when unit is not meeting the design requirements:		
Describe all operating ranges and maintenance procedures required by the manufacturer to maintain the warranty.		
Additional information attached? ☐ Yes ☐ No Please attach copies of manufacturer's data sheets.		
Is condenser routed to a secondary APCD or ERD? ☐ Yes ☐ No		

ADSORPTION SYSTEM

General Information		
Control Device ID#:	Installation Date: ☐ New ☐ Modified ☐ Relocated	
Manufacturer:	Model:	Control Device Name:
Design Inlet Volume: scfm	Adsorbent charge per adsorber vessel and number of adsorber vessels:	
Length of Mass Transfer Zone supplied by the manufacturer:	Adsorber diameter: ft Adsorber area: ft^2	
Adsorbent type and physical properties:	Overall Control Efficiency (%):	
Working Capacity of Adsorbent (%):		
Operating Parameters		
Inlet volume: scfm @ °F		
Adsorption time per adsorption bed (life expectancy):	Breakthrough Capacity (lbs of VOC/100 lbs of adsorbent):	
Temperature range of carbon bed adsorber. °F - °F		
Control Device Technical Data		
Pollutants Controlled	Manufacturer's Guaranteed Control Efficiency (%)	
Describe the warning and/or alarm system that protects against operation when unit is not meeting the design requirements:		
Has the control device been tested by the manufacturer and certified?		
Describe all operating ranges and maintenance procedures required by the manufacturer to maintain the warranty.		
Additional information attached? ☐ Yes ☐ No Please attach copies of manufacturer's data sheets, drawings, and performance testing.		

VAPOR RECOVERY UNIT

General Information

Emission Unit ID#:	Installation Date: ☐ New ☐ Modified ☐ Relocated

Device Information

Manufacturer:
Model:

List the emission units whose emissions are controlled by this vapor recovery unit (Emission Point ID#)

Emission Unit ID#	Emission Source Description	Emission Unit ID#	Emission Source Description

If this vapor recovery unit controls emissions from more than six (6) emission units, please attach additional pages.

Additional information attached? ☐ Yes ☐ No
Please attach copies of manufacturer's data sheets, drawings, and performance testing.

The registrant may claim a capture and control efficiency of 95 % (which accounts for 5% downtime) for the vapor recovery unit.

The registrant may claim a capture and control efficiency of 98% if the VRU has a backup flare that meet the requirements of Section 8.1.2 of this general permit.

The registrant may claim a capture and control efficiency of 98% if the VRU has a backup VRU.

ATTACHMENT U – EMISSIONS CALCULATIONS

Provide detailed potential to emit (PTE) emission calculations for criteria and hazardous air pollutants (HAPs) for each emission point identified in the application. For hazardous air pollutants and volatile organic compounds (VOCs), the speciated emission calculations must be included.

Use the following guidelines to ensure complete emission calculations:

- All emission sources and fugitive emissions are included in the emission calculations, as well as all methods used to calculate the emissions.
- Proper emission point identification numbers and APCD and ERD identification numbers are used consistently in the emission calculations that are used throughout the application.
- A printout of the emission summary sheets is attached to the registration application.
- Printouts of any modeling must be included with the emission calculations. The modeling printout must show all inputs/outputs or assumptions that the modeled emissions are based upon.
- If emissions are provided from the manufacturer, the manufacturer's documentation and/or certified emissions must also be included.
- The emission calculations results must match the emissions provided on the emissions summary sheet.
- If calculations are based on a compositional analysis of the gas, attach the laboratory analysis. Include the following information: the location that the sample was taken as representative; the date the sample was taken; and, if the sample is considered representative, the reasons that it is considered representative (same gas field, same formation and depth, distance from actual site, etc.).
- Potential to emit (PTE) from the main or backup control device may be calculated based on the highest emission from a control device that could handle the stream, plus any intrinsic emission such as those from pilot flames.
- Provide any additional clarification as necessary. Additional clarification or information is especially helpful when reviewing modeling calculations to assist the engineer in understanding the basis of assumptions and/or inputs.

Please follow specific guidance provided on the emissions summary sheet when providing the calculations.

ATTACHMENT V – FACILITY-WIDE CONTROLLED EMISSIONS SUMMARY SHEET

List all sources of emissions in this table. Use extra pages if necessary.

Emission Point ID#	NO_x		CO		VOC		SO_2		PM_{10}		$PM_{2.5}$		GHG (CO_2e)	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
TOTAL														

Annual emissions shall be based on 8,760 hours per year of operation for all emission units except emergency generators.
According to 45CSR14 Section 2.43.e, fugitive emissions are not included in the major source determination because it is not listed as one of the source categories in Table 1. Therefore, fugitive emissions shall not be included in the PTE above.

ATTACHMENT V – FACILITY-WIDE HAP CONTROLLED EMISSIONS SUMMARY SHEET

List all sources of emissions in this table. Use extra pages if necessary.

Emission Point ID#	Formaldehyde		Benzene		Toluene		Ethylbenzene		Xylenes		Hexane		Total HAPs	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
TOTAL														

Annual emissions shall be based on 8,760 hours per year of operation for all emission units except emergency generators.
According to 45CSR14 Section 2.43.e, fugitive emissions are not included in the major source determination because it is not listed as one of the source categories in Table 1. Therefore, fugitive emissions shall not be included in the PTE above.

ATTACHMENT W – CLASS I LEGAL ADVERTISEMENT

Publication of a proper Class I legal advertisement is a requirement of the G35-D registration process. In the event the applicant's legal advertisement fails to follow the requirements of 45CSR13, Section 8 or the requirements of Chapter 59, Article 3, of the West Virginia Code, the application will be considered incomplete and no further review of the application will occur until this is corrected.

The applicant, utilizing the format for the Class I legal advertisement example provided on the following page, shall have the legal advertisement appear a minimum of one (1) day in the newspaper most commonly read in the area where the facility exists or will be constructed. The notice must be published no earlier than five (5) working days of receipt by this office of your application. The original affidavit of publication must be received by this office no later than the last day of the public comment period.

The advertisement shall contain, at a minimum, the name of the applicant, the type and location of the source, the type and amount of air pollutants that will be discharged (include fugitive emissions separately), the nature of the permit being sought, the proposed start-up date for the source, and a contact telephone number for more information.

The location of the source should be as specific as possible starting with: 1.) the street address of the source; 2.) the nearest street or road; 3.) the nearest town or unincorporated area, 4.) the county, and 5.) latitude and longitude coordinates in decimal format.

Types and amounts of pollutants discharged must include all regulated pollutants (Nitrogen Oxides, Carbon Monoxide, Particulate Matter-2.5, Particulate Matter-10, Volatile Organic Compounds, Sulfur Dioxide, Formaldehyde, Benzene, Toluene, Ethylbenzene, Xylenes, Hexane, Total Hazardous Air Pollutants) and their potential to emit or the permit level being sought in units of tons per year.

In the event the 30th day is a Saturday, Sunday, or legal holiday, the comment period will be extended until 5:00 p.m. on the following regularly scheduled business day.

A list of qualified newspapers that are eligible to publish legal ads may be found:

http://www.sos.wv.gov/elections/resource/Documents/Qualified%20Newspapers.pdf

PUBLIC NOTICE

AIR QUALITY PERMIT NOTICE
Notice of Application

Notice is given that HG Energy, LLC. has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a G35-D General Permit Modification for a natural gas compressor and dehydration (Gans Compressor Station) facility located near Laurel Aggregates Quarry in Monongalia County, West Virginia near the town of Springhill, PA. The latitude and longitude coordinates are: 39.46923811, -79.66833995.

The applicant estimates the decrease potential to discharge the following Regulated Air Pollutants will be:

Nitrogen Oxide (NOx)	Decrease 7.596 tons/Yr
Carbon Monoxide (CO)	Decrease 11.695 Tons/Yr
Volatile Organic Compounds (VOC)	Decrease 17.247 Tons/Yr
Particulate Matter (PM10)	Decrease 1.258 Tons/Yr
Sulfer Dioxide (SO2)	Decrease 0.135 Tons/Yr
Total Hazardous Air Pollutants (HAPS)	Decrease 4.956 Tons/Yr
Carbon Dioxide (CO2) Equivalent	Decrease 4,629.20 Tons/Yr

Startup of operation is planned to begin on or about the 1st day of April, 2017. Written comments will be received by the West Virginia Department of Environmental Protection, Division of Air Quality, 601 57th Street, SE, Charleston, WV 25304, for at least 30 calendar days from the date of publication of this notice.

Any questions regarding this permit application should be directed to the DAQ at (304) 926-0499, extension 1250, during normal business hours.
Dated this the 13th day of February, 2017.

By: HG Energy, LLC.
Matthew J. McGuire
Health, Safety, Environmental Manager
5260 Dupont Road
Parkersburg, WV 26101

Appendix A
Supporting Documents

Emissions Calculations
Gri-GlyCalc
Gas Analysis
E&P Tanks
Compressor Engine Specs
Emission Factors

HG Energy, LLC
Gans Compressor Station
Monongalia County, WV
170-758
Emissions Summary

Prepared By: JAM
Date Prepared: 2/9/2017

Reviewed By: N/A
Date Reviewed: 2/12/2017

Emissions Unit ID	Emission Point ID	Emission Unit Description	NO_x (Tons per year)	CO (Tons per year)	VOC (Tons per year)	SO_2 (Tons per year)	PM_{10} (Tons per year)	HAPs (Tons per year)	CO_2e (Tons per year)	
CE-1 (new)	CE-1 (new)	Caterpillar G3508TALE	12.168	9.732	1.702	0.014	0.235	1.977	3396.395	
ACE-1	ACE-1	Kohler Command Pro 13 Air Compressor	0.190	7.850	0.190	0.010	0.010	0.010	14.140	
TL	TL	Brine/Pipeline Liquids Truck Loading	-	-	0.000	-	-	0.000	-	
TK-1	TK-1	Brine/Pipeline Liquids	-	-	0.076	-	-	0.002	0.350	
TK-2	TK-2	Brine/Pipeline Liquids	-	-	0.076	-	-	0.002	0.350	
DEHY-1	RBL-1	Dehydrator Reboiler	0.086	0.072	0.005	0.001	0.007	0.002	103.671	
DEHY-1	STL-1, FT-1	Dehydrator Still Vent and Flash Tank	-	-	0.290	-	-	0.092	-	
FUG	FUG	Fugitive Emissions	-	-	0.004	-	-	0.000	0.452	
TOTAL	N/A	N/A	**12.444**	**17.655**	**2.343**	**0.025**	**0.252**	**2.084**	**3515.358**	
EXISTING	N/A	N/A	*20.040*	*29.350*	*19.590*	*0.160*	*1.510*	*7.040*	*8144.560*	
NET DECREASE	N/A	N/A	**-7.596**	**-11.695**	**-17.247**	**-0.135**	**-1.258**	**-4.956**	**-4629.202**	

HG Energy, LLC
Gans Compressor Station
Monongalia County, WV
170-758
Emissions Unit Summary

Prepared By: JAM

Date Prepared: 2/9/2017

Reviewed By: KAM

Date Reviewed: 2/12/2017

Emissions Unit ID	Emission Point ID	Emission Unit Description	Year Installed	Year Removed	Design Capacity	Control Device
CE-1 (old)	CE-1 (old)	Ajax DPC 2802LE Compressor Engine	2007	2017	384 bhp/440 rpm	N/A
CE-2	CE-2	Ajax DPC 2802LE Compressor Engine	2007	2017	384 bhp/440 rpm	N/A
CE-1 (new)	CE-1 (new)	Caterpillar G3508TALE	2017	N/A	630 hp/1400 rpm	N/A
ACE-1	ACE-1	Kohler Command Pro 13 Air Compressor	2015	N/A	13 bhp	N/A
TL	TL	Brine/Pipeline Liquids Truck Loading	2007	N/A	N/A	N/A
TK-1	TK-1	Brine/Pipeline Liquids	2007	N/A	2,100 gal	N/A
TK-2	TK-2	Brine/Pipeline Liquids	2007	N/A	2,100 gal	N/A
DEHY-1	RBL-1	Dehydrator Reboiler	2015	N/A	6.5 MMCSCFD	N/A
DEHY-1	STL-1, FT-1	Dehydrator Still Vent and Flash Tank	2015	N/A	200 MBTU/hr	N/A
FUG	FUG	Fugitive Emissions	2007	N/A	N/A	N/A

HG Energy, LLC
Gans Compressor Station
Monongalia County, WV
170-758
CE-1 (new) Potential to Emit Calculations

Prepared By: JAM | Reviewed By: KAM
Date Prepared: 2/9/2017 | Date Reviewed: 2/12/2017

Natural Gas Engine Combustion Emissions Calculations (Potential)

Pollutant	Value	Rate	Reference	lb/hr	tons/yr
NOX	2.000	g/hp-hr	Vendor	2.778	12.168
CO	1.600	g/hp-hr	Vendor	2.222	9.732
VOC	0.280	g/hp-hr	Vendor	0.389	1.702
SO2	0.0006	lb/MMBtu	Vendor	0.003	0.014
PM	0.010	lb/MMBtu	Vendor	0.054	0.235
CO_2	500.000	g/bhp-hr	Vendor	693.833	3038.987
CH_4	2.350	g/bhp-hr	Vendor	3.264	14.296
CO_2e	N/A	N/A	N/A	775.433	3396.395
HCOH	0.250	g/hp-hr	Vendor	0.347	1.519
Total HAPs	N/A	N/A	Vendor and AP-42, Table 3.2-2	0.45	1.9765

Natural Gas Engine Combustion HAP Emissions Calculator

Compound	lb/MMBtu	Reference	lb/hr	tons/year
1,1,2,2-Tetrachloroethane	4.00E-05	AP-42, Table 3.2-2	2.15E-04	0.0009
1,1,2-Tricholorethane	3.18E-05	AP-42, Table 3.2-2	1.71E-04	0.0007
1,3-Butadiene	2.67E-04	AP-42, Table 3.2-2	1.44E-03	0.0063
1,3-Dichloropropene	2.64E-05	AP-42, Table 3.2-2	1.42E-04	0.0006
2-Methylnaphthalene	3.32E-05	AP-42, Table 3.2-2	1.78E-04	0.0008
2,2,4-Trimethylpentane	2.50E-04	AP-42, Table 3.2-2	1.34E-03	0.0059
Acenaphthene	1.25E-06	AP-42, Table 3.2-2	6.72E-06	0.0000
Acenaphthylene	5.53E-06	AP-42, Table 3.2-2	2.97E-05	0.0001
Acrolein	8.36E-03	AP-42, Table 3.2-2	4.49E-02	0.1968
Benzo(b)fluroanthene	5.14E-03	AP-42, Table 3.2-2	2.76E-02	0.1210
Benzene	4.40E-04	AP-42, Table 3.2-2	2.37E-03	0.0104
Benzo(b)fluoranthene	1.66E-07	AP-42, Table 3.2-2	8.92E-07	0.0000
Benzo(e)pyrene	4.15E-07	AP-42, Table 3.2-2	2.23E-06	0.0000
Benzo(g,h,i)perylene	4.14E-07	AP-42, Table 3.2-2	2.23E-06	0.0000
Biphenyl	2.12E-04	AP-42, Table 3.2-2	1.14E-03	0.0050
Carbon tetrachloride	3.67E-05	AP-42, Table 3.2-2	1.97E-04	0.0009
Chlorobenzene	3.04E-05	AP-42, Table 3.2-2	1.63E-04	0.0007
Chloroform	2.85E-05	AP-42, Table 3.2-2	1.53E-04	0.0007
Chrysene	6.93E-07	AP-42, Table 3.2-2	3.73E-06	0.0000
Ethylbenzene	3.97E-05	AP-42, Table 3.2-2	2.13E-04	0.0009
Ethylene dirbromide	4.43E-05	AP-42, Table 3.2-2	2.38E-04	0.0010
Fluoranthene	1.11E-06	AP-42, Table 3.2-2	5.97E-06	0.0000
Fluorene	5.67E-06	AP-42, Table 3.2-2	3.05E-05	0.0001
Formaldehyde	5.28E-03	Manf. Data Sheet	3.47E-01	1.5199
Methanol	2.50E-03	AP-42, Table 3.2-2	1.34E-02	0.0589
Methylene chloride	2.00E-05	AP-42, Table 3.2-2	1.08E-04	0.0005
n-Hexane	1.11E-03	AP-42, Table 3.2-2	5.97E-03	0.0261
Naphthalene	7.44E-05	AP-42, Table 3.2-2	4.00E-04	0.0018
PAH	2.69E-05	AP-42, Table 3.2-2	1.45E-04	0.0006
Phenanthrene	1.04E-05	AP-42, Table 3.2-2	5.59E-05	0.0002
Phenol	2.40E-05	AP-42, Table 3.2-2	1.29E-04	0.0006
Pyrene	1.36E-06	AP-42, Table 3.2-2	7.31E-06	0.0000
Styrene	2.36E-05	AP-42, Table 3.2-2	1.27E-04	0.0006
Tetrachloroethane	2.48E-06	AP-42, Table 3.2-2	1.33E-05	0.0001
Toluene	4.08E-04	AP-42, Table 3.2-2	2.19E-03	0.0096
Vinyl Chloride	1.49E-05	AP-42, Table 3.2-2	8.01E-05	0.0004
Xylene	1.84E-04	AP-42, Table 3.2-2	9.89E-04	0.0043

HG Energy, LLC
Gans Compressor Station
Monongalia County, WV
170-758
Dehydration System Potential Emissions*

Prepared By: JAM | Reviewed By: KAM
Date Prepared: 2/9/2017 | Date Reviewed: 2/12/2017

Reboiler Emissions Calculations (Potential)

Pollutant	Value	Rate	Reference	lb/hr	tons/yr
NO_X	0.098039	lb/MMBtu	AP-42, Table 1.4-1	0.019608	0.08588
CO	0.082353	lb/MMBtu	AP-42, Table 1.4-1	0.016471	0.07214
VOC	0.005392	lb/MMBtu	AP-42, Table 1.4-2	0.001078	0.00472
SO_2	0.000588	lb/MMBtu	AP-42, Table 1.4-2	0.000118	0.00052
PM_{10}	0.007451	lb/MMBtu	AP-42, Table 1.4-2	0.001490	0.00653
CO_2	117.647000	lb/MMBtu	AP-42, Table 1.4-2	23.529400	103.05877
CH_4	0.002254	lb/MMBtu	AP-42, Table 1.4-2	0.000451	0.00197
N_2O	0.002157	lb/MMBtu	AP-42, Table 1.4-2	0.000431	0.00189
CO_2e	N/A	N/A	AP-42, Table 1.4-2	23.669219	103.67118
HAPs	0.001845	lb/MMBtu	AP-42, Table 1.4- 3	0.000369	0.00162

Dehydrator Regenerator Calculations (Potential, Uncontrolled)

	Value	Rate	Reference	lb/hr	tons/yr
NO_X	N/A	N/A	N/A	N/A	N/A
CO	N/A	N/A	N/A	N/A	N/A
VOC	0.06610	lb/hr	GRI-GlyCalc	0.06610	0.28952
SO_2	N/A	N/A	N/A	N/A	N/A
PM_{10}	N/A	N/A	N/A	N/A	N/A
HAPs	0.02100	lb/hr	GRI-GlyCalc	0.02100	0.09198

Natural Gas External Combustion HAP Emissions Calculator

Compound	lb/MMscf	lb/MMBtu	Reference	lb/hr	tons/year
2-Methlynaphthalene	2.40E-05	2.35E-08	AP-42, Table 1.4-3	4.71E-09	2.06E-08
3-Methlychloroanthrene	1.80E-06	1.76E-09	AP-42, Table 1.4-3	3.53E-10	1.55E-09
7,12-Dimethylbenz(a)anthracene	1.60E-06	1.57E-09	AP-42, Table 1.4-3	3.14E-10	1.37E-09
Acenaphthene	1.80E-06	1.76E-09	AP-42, Table 1.4-3	3.53E-10	1.55E-09
Acenaphthylene	1.80E-06	1.76E-09	AP-42, Table 1.4-3	3.53E-10	1.55E-09
Anthracene	2.40E-06	2.35E-09	AP-42, Table 1.4-3	4.71E-10	2.06E-09
Benz(a)anthracene	1.80E-06	1.76E-09	AP-42, Table 1.4-3	3.53E-10	1.55E-09
Benzene	2.10E-03	2.06E-06	AP-42, Table 1.4-3	4.12E-07	1.80E-06
Benzo(a)pyrene	1.20E-06	1.18E-09	AP-42, Table 1.4-3	2.35E-10	1.03E-09
Benzo(b)fluroanthene	1.80E-06	1.76E-09	AP-42, Table 1.4-3	3.53E-10	1.55E-09
Benzo(g,h,i)perylene	1.20E-06	1.18E-09	AP-42, Table 1.4-3	2.35E-10	1.03E-09
Benzo(k)fluoranthene	1.80E-06	1.76E-09	AP-42, Table 1.4-3	3.53E-10	1.55E-09
Chrysene	1.80E-06	1.76E-09	AP-42, Table 1.4-3	3.53E-10	1.55E-09
Dibenzo(a,h)anthracene	1.20E-06	1.18E-09	AP-42, Table 1.4-3	2.35E-10	1.03E-09
Dichlorobenzene	1.20E-03	1.18E-06	AP-42, Table 1.4-3	2.35E-07	1.03E-06
Fluoranthene	3.00E-06	2.94E-09	AP-42, Table 1.4-3	5.88E-10	2.58E-09
Fluorene	2.80E-06	2.75E-09	AP-42, Table 1.4-3	5.49E-10	2.40E-09
Formaldehyde	7.50E-02	7.35E-05	AP-42, Table 1.4-3	1.47E-05	6.44E-05
Hexane	1.80E+00	1.76E-03	AP-42, Table 1.4-3	3.53E-04	1.55E-03
Indeno(1,2,3-cd)pyrene	1.80E-06	1.76E-09	AP-42, Table 1.4-3	3.53E-10	1.55E-09
Naphthalene	6.10E-04	5.98E-07	AP-42, Table 1.4-3	1.20E-07	5.24E-07
Phenanathrene	1.70E-05	1.67E-08	AP-42, Table 1.4-3	3.33E-09	1.46E-08
Pyrene	5.00E-06	4.90E-09	AP-42, Table 1.4-3	9.80E-10	4.29E-09
Toluene	3.40E-03	3.33E-06	AP-42, Table 1.4-3	6.67E-07	2.92E-06

* Values from prior application, which included gas analysis and GRI-GlyCalc v. 4.0 model output

Conversion from mol% to wt% for emissions estimations

Component	mol%	MW	lb/lb-mol	lb/scf	wt fraction
Methane	97.5760	16.04	15.6541	0.0413	0.952065672
Ethane	1.7100	30.07	0.5142	0.0014	0.031272878
Propane	0.0430	44.09	0.0190	0.0000	0.001153047
iButane	0.0000	58.10	0.0000	0.0000	0
nButane	0.0010	58.10	0.0006	0.0000	3.53358E-05
iPentane	0.0000	72.15	0.0000	0.0000	0
nPentane	0.0000	72.15	0.0000	0.0000	0
Heptanes+	0.0000	175.20	0.0000	0.0000	0
2,2-Dimethylpropane	0.0000	72.15	0.0000	0.0000	0
2,2-Dimethylbutane	0.0000	86.18	0.0000	0.0000	0
2,3-Dimethylbutane	0.0000	86.18	0.0000	0.0000	0
2-Methylpentane	0.0000	86.18	0.0000	0.0000	0
3-Methylpentane	0.0000	86.18	0.0000	0.0000	0
Hexanes+	0.0000	150.00	0.0000	0.0000	0
Nitrogen	0.2530	28.02	0.0709	0.0002	0.004311486
Carbon dioxide	0.4170	44.01	0.1835	0.0005	0.011161582
Total	100.0000	1164.803	16.44226668	0.043328414	1
	Good				

NMNEHC total
0.12%

HG Energy, LLC
Gans Compressor Station
Monongalia County, WV
170-758
Fugitive Emissions from Equipment Leaks

Prepared By: JAM
Date Prepared: 2/9/2017

Reviewed By: KAM
Date Reviewed: 2/12/2017

Fugitive Emissions Calculations (Potential)

Component Type	Component count*	VOC emission factor (lb/hr/component)**	wt% VOC***	VOC emissions (lb/hr)	VOC Emissions (tons/yr)	wt% HAPs***	HAP Emissions (lb/hr)	HAP Emissions (tons/yr)	Whole gas leak rate (scf/hr/component)	Whole gas leak rate (lb/hr/component)	wt% GHG	GHG Emissions (CO_2e, lb/hr)****	GHG Emissions (CO_2e, tons/yr)****
Valves	54	0.0099	0.12%	0.0006	0.0028	0.0000	0.0000	0.0000	0.0270	0.0012	96%	0.06039	0.2645
Connectors	210	0.0009	0.12%	0.0002	0.0009	0.0000	0.0000	0.0000	0.0030	0.0001	96%	0.02610	0.1143
Open-ended lines	4	0.0044	0.12%	0.0000	0.0001	0.0000	0.0000	0.0000	0.0610	0.0026	96%	0.01011	0.0443
Relief valves	4	0.0194	0.12%	0.0001	0.0004	0.0000	0.0000	0.0000	0.0400	0.0017	96%	0.00663	0.0290
Total				0.0010	0.0043		0.0000	0.0000				0.1032	0.4521

*Based on 40 CFR 98, Subpart W, Table W-1B with 10% safety factor (1 compressor, 1 dehydrator, 1 separator, 1 meters/piping)
**From EPA 453/R-95-017, November 1995
***From gas analysis
****From 40 CFR 98, Subpart W, Table W-1A

Truck Loading VOC Losses Emissions Calculations						
Saturation value (S)	True VP of Liquid (P)	Mol. Wt. of Vapors (M)	Temperature (^{0}R)	Loading loss factor (lb VOC/kgal loaded)	Total annual volume (kgal/year)	Total VOC emissions (tons/yr)*
1.45	4.3	50	529.7	7.33	6.6	0.0002

*Assumes all liquids loaded are crude oil RVP 5 with 1% VOC emitted

HG Energy, LLC
Gans Compressor Station
Monongalia County, WV
170-758
Truck Loading Emissions

Prepared By: JAM
Date Prepared: 2/10/2017

Reviewed By: KAM
Date Reviewed: 2/12/2017

Produced Water Loading Emissions		
Pollutant	Loading losses (tons/yr)*	Method
VOC	0.0002	AP-42
Total HAPs	2.4333E-06	AP-42

*Assumes all liquids loaded are crude oil RVP 5 with 1% VOC emitted

***HAPs losses estimated as 1% of total VOC losses

GRI-GLYCalc VERSION 4.0 - SUMMARY OF INPUT VALUES

Case Name: MAGS Gans Compressor Station
File Name: Gans_GLYCalc.ddf
Date: September 24, 2014

DESCRIPTION:

Description: 7/25/2014 Gas Analysis
Maximum throughput 6.5 MMSCFD
Maximum pump rate 1.5 gpm
Uncontrolled still vent emissions

Annual Hours of Operation: 8760.0 hours/yr

WET GAS:

Temperature: 60.00 deg. F
Pressure: 900.00 psig
Wet Gas Water Content: Saturated

Component	Conc. (vol %)
Carbon Dioxide	0.4170
Nitrogen	0.2530
Methane	97.5760
Ethane	1.7100
Propane	0.0430
n-Butane	0.0010
n-Hexane	0.0000
2,2,4-Trimethylpentane	0.0000
Benzene	0.0000
Toluene	0.0000
Ethylbenzene	0.0000
Xylenes	0.0000

DRY GAS:

Flow Rate: 6.5 MMSCF/day
Water Content: 7.0 lbs. H2O/MMSCF

LEAN GLYCOL:

Glycol Type: TEG
Water Content: 1.5 wt% H2O
Flow Rate: 1.5 gpm

PUMP:

Glycol Pump Type: Gas Injection
Gas Injection Pump Volume Ratio: 0.080 acfm gas/gpm glycol

GRI-GLYCalc VERSION 4.0 - AGGREGATE CALCULATIONS REPORT

Case Name: MAGS Gans Compressor Station
File Name: Gans_GLYCalc.ddf
Date: September 24, 2014

DESCRIPTION:

Description: 7/25/2014 Gas Analysis
Maximum throughput 6.5 MMSCFD
Maximum pump rate 1.5 gpm
Uncontrolled still vent emissions

Annual Hours of Operation: 8760.0 hours/yr

EMISSIONS REPORTS:

UNCONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	23.1266	555.039	101.2946
Ethane	0.9710	23.303	4.2528
Propane	0.0432	1.037	0.1892
n-Butane	0.0019	0.046	0.0084
n-Hexane	0.0001	0.002	0.0004
2,2,4-Trimethylpentane	0.0001	0.003	0.0005
Benzene	0.0034	0.082	0.0149
Toluene	0.0049	0.118	0.0215
Ethylbenzene	0.0056	0.136	0.0247
Xylenes	0.0069	0.165	0.0301
Total Emissions	24.1637	579.929	105.8371
Total Hydrocarbon Emissions	24.1637	579.929	105.8371
Total VOC Emissions	0.0661	1.587	0.2897
Total HAP Emissions	0.0210	0.505	0.0922
Total BTEX Emissions	0.0208	0.500	0.0912

EQUIPMENT REPORTS:

ABSORBER

NOTE: Because the Calculated Absorber Stages was below the minimum allowed, GRI-GLYCalc has set the number of Absorber Stages to 1.25 and has calculated a revised Dry Gas Dew Point.

Calculated Absorber Stages: 1.25

Gans_Appendix A4_GLYCalc Aggregate

Calculated Dry Gas Dew Point:	0.59 lbs. H2O/MMSCF
Temperature:	60.0 deg. F
Pressure:	900.0 psig
Dry Gas Flow Rate:	6.5000 MMSCF/day
Glycol Losses with Dry Gas:	0.0113 lb/hr
Wet Gas Water Content:	Saturated
Calculated Wet Gas Water Content:	17.91 lbs. H2O/MMSCF
Calculated Lean Glycol Recirc. Ratio:	19.19 gal/lb H2O

Component	Remaining in Dry Gas	Absorbed in Glycol
Water	3.32%	96.68%
Carbon Dioxide	99.59%	0.41%
Nitrogen	99.97%	0.03%
Methane	99.98%	0.02%
Ethane	99.92%	0.08%
Propane	99.87%	0.13%
n-Butane	99.73%	0.27%
n-Hexane	99.31%	0.69%
2,2,4-Trimethylpentane	99.48%	0.52%
Benzene	71.06%	28.94%
Toluene	58.80%	41.20%
Ethylbenzene	50.52%	49.48%
Xylenes	39.81%	60.19%

REGENERATOR

No Stripping Gas used in regenerator.

Component	Remaining in Glycol	Distilled Overhead
Water	72.93%	27.07%
Carbon Dioxide	0.00%	100.00%
Nitrogen	0.00%	100.00%
Methane	0.00%	100.00%
Ethane	0.00%	100.00%
Propane	0.00%	100.00%
n-Butane	0.00%	100.00%
n-Hexane	0.40%	99.60%
2,2,4-Trimethylpentane	1.12%	98.88%
Benzene	4.96%	95.04%
Toluene	7.84%	92.16%
Ethylbenzene	10.32%	89.68%
Xylenes	12.81%	87.19%

STREAM REPORTS:

WET GAS STREAM

Temperature: 60.00 deg. F
Pressure: 914.70 psia
Flow Rate: 2.71e+005 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	3.77e-002	4.85e+000
Carbon Dioxide	4.17e-001	1.31e+002
Nitrogen	2.53e-001	5.06e+001
Methane	9.75e+001	1.12e+004
Ethane	1.71e+000	3.67e+002
Propane	4.30e-002	1.35e+001
n-Butane	1.00e-003	4.15e-001
n-Hexane	1.90e-005	1.17e-002
2,2,4-Trimethylpentane	1.90e-005	1.55e-002
Benzene	2.10e-005	1.17e-002
Toluene	1.80e-005	1.18e-002
Ethylbenzene	1.50e-005	1.14e-002
Xylenes	1.50e-005	1.14e-002
Total Components	100.00	1.17e+004

DRY GAS STREAM

Temperature: 60.00 deg. F
Pressure: 914.70 psia
Flow Rate: 2.71e+005 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	1.25e-003	1.61e-001
Carbon Dioxide	4.15e-001	1.30e+002
Nitrogen	2.53e-001	5.06e+001
Methane	9.76e+001	1.12e+004
Ethane	1.71e+000	3.67e+002
Propane	4.30e-002	1.35e+001
n-Butane	9.97e-004	4.14e-001
n-Hexane	1.89e-005	1.16e-002
2,2,4-Trimethylpentane	1.89e-005	1.54e-002
Benzene	1.49e-005	8.32e-003
Toluene	1.06e-005	6.96e-003
Ethylbenzene	7.58e-006	5.74e-003
Xylenes	5.97e-006	4.53e-003
Total Components	100.00	1.17e+004

LEAN GLYCOL STREAM

Temperature: 60.00 deg. F
Flow Rate: 1.50e+000 gpm

Gans_Appendix A4_GLYCalc Aggregate

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.85e+001	8.32e+002
Water	1.50e+000	1.27e+001
Carbon Dioxide	6.33e-012	5.34e-011
Nitrogen	1.53e-013	1.29e-012
Methane	9.91e-018	8.37e-017
Ethane	1.64e-008	1.38e-007
Propane	8.77e-011	7.41e-010
n-Butane	3.35e-012	2.83e-011
n-Hexane	4.79e-008	4.05e-007
2,2,4-Trimethylpentane	1.47e-007	1.24e-006
Benzene	2.11e-005	1.78e-004
Toluene	4.94e-005	4.17e-004
Ethylbenzene	7.70e-005	6.50e-004
Xylenes	1.19e-004	1.01e-003
Total Components	100.00	8.45e+002

RICH GLYCOL AND PUMP GAS STREAM

Temperature: 60.00 deg. F
Pressure: 914.70 psia
Flow Rate: 1.56e+000 gpm
NOTE: Stream has more than one phase.

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.51e+001	8.32e+002
Water	1.99e+000	1.74e+001
Carbon Dioxide	8.88e-002	7.76e-001
Nitrogen	1.22e-002	1.06e-001
Methane	2.65e+000	2.31e+001
Ethane	1.11e-001	9.71e-001
Propane	4.94e-003	4.32e-002
n-Butane	2.18e-004	1.91e-003
n-Hexane	1.17e-005	1.02e-004
2,2,4-Trimethylpentane	1.27e-005	1.11e-004
Benzene	4.11e-004	3.59e-003
Toluene	6.08e-004	5.32e-003
Ethylbenzene	7.21e-004	6.30e-003
Xylenes	9.01e-004	7.88e-003
Total Components	100.00	8.74e+002

REGENERATOR OVERHEADS STREAM

Temperature: 212.00 deg. F
Pressure: 14.70 psia
Flow Rate: 6.67e+002 scfh

Component	Conc. (vol%)	Loading (lb/hr)

Gans_Appendix A4_GLYCalc	Aggregate	
Water	1.49e+001	4.70e+000
Carbon Dioxide	1.00e+000	7.76e-001
Nitrogen	2.16e-001	1.06e-001
Methane	8.20e+001	2.31e+001
Ethane	1.84e+000	9.71e-001
Propane	5.57e-002	4.32e-002
n-Butane	1.87e-003	1.91e-003
n-Hexane	6.74e-005	1.02e-004
2,2,4-Trimethylpentane	5.48e-005	1.10e-004
Benzene	2.48e-003	3.41e-003
Toluene	3.03e-003	4.90e-003
Ethylbenzene	3.03e-003	5.65e-003
Xylenes	3.68e-003	6.87e-003
Total Components	100.00	2.97e+001

Mid-Atlantic Gas Services, L.L.C.
Gans Compressor Station
Normalized Gas Analysis

Component	Gas Analysis	Normalized Gas Analysis
Nitrogen	**0.253**	*0.253*
Carbon Dioxide	**0.417**	*0.417*
Methane	**97.576**	*97.576*
Ethane	**1.710**	*1.710*
Propane	**0.043**	*0.043*
Isobutane	**0.000**	*0.000*
Butane	**0.001**	*0.001*
Isopentane	**0.000**	*0.000*
Pentane	**0.000**	*0.000*
Other Hexanes	**0.000**	*0.000*
Heptanes	**0.000**	*0.000*
C8+ Heavies	**0.000**	*0.000*
Nonanes	**0.000**	*0.000*
Decanes	**0.000**	*0.000*
Cyclohexane	**0.000**	*0.000*
Methylcyclohexane	**0.000**	*0.000*
Cyclopentane	**0.000**	*0.000*
n-Hexane	**1.91E-05**	*0.000019*
Benzene	**2.10472E-05**	*0.000021*
Toluene	**1.78424E-05**	*0.000018*
Ethylbenzene	**1.54846E-05**	*0.000015*
Xylenes	**1.54846E-05**	*0.000015*
2,2,4-Trimethylpentane	**1.90775E-05**	*0.000019*
Total =	**100.0000889**	***100.000***

Notes:

1) Enter Gas Sample Molecular Weight = **16.44**

2) HAP Molecular Weights:

n-Hexane	86.175	1.91E-05
Benzene	78.11	2.10E-05
Toluene	92.14	1.78E-05
Ethlybenzene	106.17	1.55E-05
Xylenes	106.17	1.55E-05
2,2,4-Trimethylpentane	114.23	1.44E-05

3) Minimum detection level is 0.0001 wt %.

Certificate of Analysis

Number: 2030-14070237-001A

Carencro Laboratory
4700 NE Evangeline Thruway
Carencro, LA 70520

Gary Vermilion
Gas Analytical Services
PO Box 1028
Bridgeport, WV 26330

July 25, 2014

Field: Chesapeake Energy
Station Name: Valley Point Addl
Sample Point: Upstream
Cylinder No: 248
Analyzed: 07/25/2014 09:09:01 by CC

Sampled By: TG-GAS
Sample Of: Gas Spot
Sample Date: 07/18/2014
Sample Conditions: 877 psig. @ 84 °F
Method: GPA-2261

Analytical Data

Components	Mol. %	Wt. %	GPM at 14.73 psia
Nitrogen	0.253	0.431	
Carbon Dioxide	0.417	1.116	
Methane	97.576	95.207	
Ethane	1.710	3.127	0.459
Propane	0.043	0.116	0.012
Iso-butane	NIL	NIL	NIL
n-Butane	0.001	0.004	NIL
Iso-pentane	NIL	NIL	NIL
n-Pentane	NIL	NIL	NIL
Hexanes Plus	NIL	NIL	NIL
	100.000	100.000	0.470

GPM TOTAL C2+	0.470
GPM TOTAL C3+	0.012
GPM TOTAL iC5+	0.000

Physical Properties	Total	C6+
Relative Density Real Gas	0.5856	NIL
Calculated Molecular Weight	16.44	NIL
Compressibility Factor	0.9979	
GPA 2172-09 Calculation:		
Calculated Gross BTU per ft³ @ 14.73 psia & 60°F		
Real Gas Dry BTU	1021.4	NIL
Water Sat. Gas Base BTU	1003.9	NIL

Comments: H2O Mol% : 1.740 ; Wt% : 1.903
Unable to perform GPA-2286. No components past N-Butane.

Hydrocarbon Laboratory Manager

Quality Assurance: The above analyses are performed in accordance with ASTM, UOP, GPA guidelines for quality assurance, unless otherwise stated.

```
**********************************************************************************
*     Project Setup Information                                                  *
**********************************************************************************
Project File               : \\SVR-COLUMBUS\Projects\2017\170-758\-Calculations\170-758_EPTNKS_COND.ept3
Flowsheet Selection        : Oil Tank with Separator
Calculation Method         : RVP Distillation
Control Efficiency         :  0.00%
Known Separator Stream     : Geographical Region
Geographical Region        : Northeast US
Entering Air Composition   : No
Component Group            : C10+

Filed Name                 : Marcellus
Well Name                  : Gans Compressor Station
Well ID                    : 170-758 Gans Compressor Station
Date                       : 2/10/2017


**********************************************************************************
*     Data Input                                                                 *
**********************************************************************************

Separator Pressure (psia)          : 300.00
Separator Temperature (F)          : 80.0
C10+ SG                            : 0.88
C10+ MW(lb/lbmol)                  : 296.00

-- Low Pressure Oil -----------------------------------------------------------
No.    Component           Mole%     Wt%
1      H2S                    0.0000   0.0000
2      O2                     0.0000   0.0000
3      CO2                    0.0300   0.0129
4      N2                     0.0900   0.0247
5      C1                     8.4300   1.3236
6      C2                     4.2300   1.2451
7      C3                     5.9100   2.5512
8      i-C4                   5.1700   2.9413
9      n-C4                   6.2200   3.5386
10     i-C5                   8.9100   6.2926
11     n-C5                   4.9700   3.5100
12     C6                     9.1100   7.6832
13     C7                    11.3400  11.1224
14     C8                    10.3900  11.6175
15     C9                     5.9600   7.4838
16     C10+                  11.7500  34.0446
17     Benzene                0.3700   0.2829
18     Toluene                0.9800   0.8838
19     E-Benzene              0.1500   0.1559
20     Xylenes                1.1900   1.2367
21     n-C6                   4.8000   4.0492
22     224Trimethylp          0.0000   0.0000

-- Sales Oil ------------------------------------------------------------------
Production Rate (bbl/day)      : 0.02
Days of Annual Operation       : 365
API Gravity                    : 58.00
Reid Vapor Pressure (psia)     : 10.60
Ambient Pressure (psia)        : 14.70
Ambient Temperature (F)        : 80.0


**********************************************************************************
*     Calculation Results                                                        *
**********************************************************************************

-- Emission Summary -----------------------------------------------------------
```

	Uncontrolled ton
Total HAPs	0.0020
Total HC	0.1020
VOCs, C2+	0.0890
VOCs, C3+	0.0760
CO2	0.0000
CH4	0.0140

Uncontrolled Recovery Information:

Vapor(mscfd):	0.0055
HC Vapor(mscfd):	0.0054
CO2(mscfd):	0.0000
CH4(mscfd):	0.0000
GOR(SCF/STB):	274.0000

-- Emission Composition ----------

No	Component	Uncontrolled ton
1	H2S	0.0000
2	O2	0.0000
3	CO2	0.0000
4	N2	0.0000
5	C1	0.0140
6	C2	0.0130
7	C3	0.0230
8	i-C4	0.0160
9	n-C4	0.0140
10	i-C5	0.0120
11	n-C5	0.0050
12	C6	0.0030
13	Benzene	0.0000
14	Toluene	0.0000
15	E-Benzene	0.0000
16	Xylenes	0.0000
17	n-C6	0.0020
18	224Trimethylp	0.0000
19	Pseudo Comp1	0.0010
20	Pseudo Comp2	0.0000
21	Pseudo Comp3	0.0000
22	Pseudo Comp4	0.0000
23	Pseudo Comp5	0.0000
24	Total	0.1030

-- Stream Data ----------

No	Component	MW lb/lbmol	LP Oil mole %	Flash Oil mole %	Sales Oil mole %	Flash Gas mole %	W&S Gas mole %	Total Emission mole %
1	H2S	34.80	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2	O2	32.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3	CO2	44.01	0.0300	0.0018	0.0000	0.1249	0.0485	0.1162
4	N2	28.01	0.0900	0.0005	0.0000	0.3915	0.0136	0.3486
5	C1	16.04	8.4300	0.2005	0.0000	36.1576	5.2759	32.6518
6	C2	30.07	4.2300	0.6283	0.0064	16.3651	16.3713	16.3658
7	C3	44.10	5.9100	2.5869	1.1945	17.1065	37.8292	19.4590
8	i-C4	58.12	5.1700	3.8337	3.4128	9.6722	14.4881	10.2190
9	n-C4	58.12	6.2200	5.3788	5.1076	9.0542	12.2435	9.4162
10	i-C5	72.15	8.9100	9.8030	9.9038	5.9011	7.2523	6.0545
11	n-C5	72.15	4.9700	5.7041	5.8087	2.4967	3.0558	2.5602
12	C6	84.00	9.1100	11.3895	11.7693	1.4298	1.7767	1.4692
13	Benzene	78.11	0.3700	0.4661	0.4823	0.0462	0.0566	0.0474
14	Toluene	92.14	0.9800	1.2612	1.3094	0.0327	0.0415	0.0337
15	E-Benzene	106.17	0.1500	0.1941	0.2016	0.0016	0.0021	0.0016
16	Xylenes	106.17	1.1900	1.5401	1.6004	0.0103	0.0135	0.0107
17	n-C6	86.18	4.8000	6.0082	6.2100	0.7294	0.8993	0.7486
18	224Trimethylp	114.24	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
19	Pseudo Comp1	101.26	21.7300	28.0448	29.1293	0.4535	0.5965	0.4697
20	Pseudo Comp2	121.00	5.9600	7.7210	8.0247	0.0265	0.0352	0.0275

21 Pseudo Comp3	177.66	5.6783	7.3635	7.6544	0.0003	0.0004	0.0003
22 Pseudo Comp4	311.87	3.8287	4.9650	5.1612	0.0000	0.0000	0.0000
23 Pseudo Comp5	568.48	2.2431	2.9088	3.0237	0.0000	0.0000	0.0000

	LP Oil	Flash Oil	Sales Oil	Flash Gas	W&S Gas	Total Emission
MW (lb/lbmol):	100.30	118.86	121.64	37.77	48.46	38.99
Stream Mole Ratio:	1.0000	0.7711	0.7418	0.2289	0.0293	0.2582
Stream Weight Ratio:	100.30	91.66	90.24	8.64	1.42	10.07
Total Emission (ton):				0.088	0.015	0.103
Heating Value (BTU/scf):				2159.23	2739.38	2225.09
Gas Gravity (Gas/Air):				1.30	1.67	1.35
Bubble Pt. @100F (psia):	339.60	24.39	11.48			
RVP @100F (psia):	83.01	15.82	10.58			
Spec. Gravity @100F:	0.73	0.76	0.77			

USA COMPRESSION

Emissions Report

2/8/2017

USA Compression Unit 1615, G3508TALE/JGJ4

Engine Serial Number	9TG00496	**Engine Manufactured Date**	2/15/2006
Max HP	630	**Max RPM**	1400
Number of Engine Cylinders	8	**Total Displacement (in3)**	2105
Combustion Type & Setting	4 Stroke Lean Burn	**Fuel Delivery Method**	Carburetor
Compression Ratio	8:1	**Combustion Air Treatment**	Turbocharged and Aftercooled
Engine Modified/Reconstructed?			
Compressor Frame Serial #	F22687	**Unit Packaged Date**	5/31/2006
Compressor Frame Max RPM	1800	**# of Compressor Throws**	4

AIR ENVIRONMENTAL REGULATIONS

County and State selected for Quote: Wetzel, WV

NSPS JJJJ	NOx	CO	VOC	
Ozone Non-Attainment/General Permit	NOx	CO	VOC	CH20

RAW ENGINE EMISSIONS

(based on assumption of burning 900-970 LHV BTU/SCF or 80-85 Fuel Methane # Fuel Gas with little to no H2S)

Fuel Consumption: 8533 HHV BTU/bhp-hr

	g/bhp-hr	lb/MMBTU	lb/hr	TPY
Nitrogren Oxides (NOx)	2		2.778	12.168
Carbon Monoxide (CO)	1.6		2.222	9.732
Volatile Organic Compounds (NMNEHC excluding CH2O)	0.28		0.389	1.704
Formaldehyde (CH2O)	0.25		0.347	1.52
Particulate Matter (PM) Filterable+Condensable		0.0100	0.0537	0.2352
Sulfur Dioxide (SO2)		0.0006	0.0032	0.0138
	g/bhp-hr	**lb/MMBTU**	**lb/hr**	**Metric Tonne/yr**
Carbon Dioxide (CO2)	500		694.4444	2758.881
Methane (CH4)	2.35		3.264	12.967

CONTROLLED EMISSIONS

Catalytic Converter Make/Model	IQ-18-10
Catalyst Element Type	Oxidation
# of Catalyst Elements Currently in Housing	0
Air/Fuel Ratio Control	Yes
Other Engine Emissions Control Equipment	

	% Reduction Required to Comply with JJJJ & Non-Attainment / General Permit Limits	lb/hr	TPY
Nitrogen Oxides (NOx)	0	2.778	12.168
Carbon Monoxide (CO)	0	2.222	9.732
Volatile Organic Compounds (NMNEHC excluding CH2O)	0	0.389	1.704
Formaldehyde (CH2O)	0	0.347	1.52
Particulate Matter (PM) Filterable+Condensable	0	0.0537	0.2352
Sulfur Dioxide (SO2)	0	0.0032	0.0138
	% Reduction Required to Comply with JJJJ & Non-Attainment / General Permit Limits	**lb/hr**	**Metric Tonne/yr**
Carbon Dioxide (CO2)	0	694.4444	2758.8810
Methane (CH4)	0	3.264	12.967

1. g/bhp-hr are based on Engine Manufacturer Specifications assuming a "Pipeline Quality" fuel gas composition, 1200 ft elevation, and 100- 110 F Max Air Inlet. Note that g/bhp-hr values are based on 100% engine load operation and some g/hp-hr values are Nominal and are not representative of Not- To-Exceed values. It is recommended to apply safety factor (i.e. increase the value by a nominal percentage) to the g/hp- hr values for Air Permitting to allow for operational flexibility and variations in fuel gas composition.
2. lb/MMBTU emission Factors are based on EPA's AP-42, Fifth Edition, Volume I, Chapter 3: Stationary Internal Combution Sources (Section 3.2 Natural Gas-Fired Reciprocating Engines).

Table 3.3-1. EMISSION FACTORS FOR UNCONTROLLED GASOLINE AND DIESEL INDUSTRIAL ENGINES[a]

Pollutant	Gasoline Fuel (SCC 2-02-003-01, 2-03-003-01)		Diesel Fuel (SCC 2-02-001-02, 2-03-001-01)		EMISSION FACTOR RATING
	Emission Factor (lb/hp-hr) (power output)	Emission Factor (lb/MMBtu) (fuel input)	Emission Factor (lb/hp-hr) (power output)	Emission Factor (lb/MMBtu) (fuel input)	
NO_x	0.011	1.63	0.031	4.41	D
CO	6.96 E-03[d]	0.99[c]	6.68 E-03	0.95	D
SO_x	5.91 E-04	0.084	2.05 E-03	0.29	D
PM-10[b]	7.21 E-04	0.10	2.20 E-03	0.31	D
CO_2[c]	1.08	154	1.15	164	B
Aldehydes	4.85 E-04	0.07	4.63 E-04	0.07	D
TOC					
Exhaust	0.015	2.10	2.47 E-03	0.35	D
Evaporative	6.61 E-04	0.09	0.00	0.00	E
Crankcase	4.85 E-03	0.69	4.41 E-05	0.01	E
Refueling	1.08 E-03	0.15	0.00	0.00	E

[a] References 2,5-6,9-14. When necessary, an average brake-specific fuel consumption (BSFC) of 7,000 Btu/hp-hr was used to convert from lb/MMBtu to lb/hp-hr. To convert from lb/hp-hr to kg/kw-hr, multiply by 0.608. To convert from lb/MMBtu to ng/J, multiply by 430. SCC = Source Classification Code. TOC = total organic compounds.

[b] PM-10 = particulate matter less than or equal to 10 μm aerodynamic diameter. All particulate is assumed to be ≤ 1 μm in size.

[c] Assumes 99% conversion of carbon in fuel to CO_2 with 87 weight % carbon in diesel, 86 weight % carbon in gasoline, average BSFC of 7,000 Btu/hp-hr, diesel heating value of 19,300 Btu/lb, and gasoline heating value of 20,300 Btu/lb.

[d] Instead of 0.439 lb/hp-hr (power output) and 62.7 lb/mmBtu (fuel input), the correct emissions factors values are 6.96 E-03 lb/hp-hr (power output) and 0.99 lb/mmBtu (fuel input), respectively. This is an editorial correction. March 24, 2009

Table 3.3-2. SPECIATED ORGANIC COMPOUND EMISSION FACTORS FOR UNCONTROLLED DIESEL ENGINES[a]

EMISSION FACTOR RATING: E

Pollutant	Emission Factor (Fuel Input) (lb/MMBtu)
Benzene[b]	9.33 E-04
Toluene[b]	4.09 E-04
Xylenes[b]	2.85 E-04
Propylene	2.58 E-03
1,3-Butadiene[b,c]	<3.91 E-05
Formaldehyde[b]	1.18 E-03
Acetaldehyde[b]	7.67 E-04
Acrolein[b]	<9.25 E-05
Polycyclic aromatic hydrocarbons (PAH)	
Naphthalene[b]	8.48 E-05
Acenaphthylene	<5.06 E-06
Acenaphthene	<1.42 E-06
Fluorene	2.92 E-05
Phenanthrene	2.94 E-05
Anthracene	1.87 E-06
Fluoranthene	7.61 E-06
Pyrene	4.78 E-06
Benzo(a)anthracene	1.68 E-06
Chrysene	3.53 E-07
Benzo(b)fluoranthene	<9.91 E-08
Benzo(k)fluoranthene	<1.55 E-07
Benzo(a)pyrene	<1.88 E-07
Indeno(1,2,3-cd)pyrene	<3.75 E-07
Dibenz(a,h)anthracene	<5.83 E-07
Benzo(g,h,l)perylene	<4.89 E-07
TOTAL PAH	1.68 E-04

[a] Based on the uncontrolled levels of 2 diesel engines from References 6-7. Source Classification Codes 2-02-001-02, 2-03-001-01. To convert from lb/MMBtu to ng/J, multiply by 430.
[b] Hazardous air pollutant listed in the *Clean Air Act*.
[c] Based on data from 1 engine.

Table 1.4-1. EMISSION FACTORS FOR NITROGEN OXIDES (NO_x) AND CARBON MONOXIDE (CO) FROM NATURAL GAS COMBUSTION[a]

Combustor Type (MMBtu/hr Heat Input) [SCC]	NO_x[b]		CO	
	Emission Factor ($lb/10^6$ scf)	Emission Factor Rating	Emission Factor ($lb/10^6$ scf)	Emission Factor Rating
Large Wall-Fired Boilers (>100) [1-01-006-01, 1-02-006-01, 1-03-006-01]				
Uncontrolled (Pre-NSPS)[c]	280	A	84	B
Uncontrolled (Post-NSPS)[c]	190	A	84	B
Controlled - Low NO_x burners	140	A	84	B
Controlled - Flue gas recirculation	100	D	84	B
Small Boilers (<100) [1-01-006-02, 1-02-006-02, 1-03-006-02, 1-03-006-03]				
Uncontrolled	100	B	84	B
Controlled - Low NO_x burners	50	D	84	B
Controlled - Low NO_x burners/Flue gas recirculation	32	C	84	B
Tangential-Fired Boilers (All Sizes) [1-01-006-04]				
Uncontrolled	170	A	24	C
Controlled - Flue gas recirculation	76	D	98	D
Residential Furnaces (<0.3) [No SCC]				
Uncontrolled	94	B	40	B

[a] Reference 11. Units are in pounds of pollutant per million standard cubic feet of natural gas fired. To convert from $lb/10^6$ scf to $kg/10^6$ m^3, multiply by 16. Emission factors are based on an average natural gas higher heating value of 1,020 Btu/scf. To convert from $lb/10^6$ scf to lb/MMBtu, divide by 1,020. The emission factors in this table may be converted to other natural gas heating values by multiplying the given emission factor by the ratio of the specified heating value to this average heating value. SCC = Source Classification Code. ND = no data. NA = not applicable.

[b] Expressed as NO_2. For large and small wall fired boilers with SNCR control, apply a 24 percent reduction to the appropriate NO_x emission factor. For tangential-fired boilers with SNCR control, apply a 13 percent reduction to the appropriate NO_x emission factor.

[c] NSPS=New Source Performance Standard as defined in 40 CFR 60 Subparts D and Db. Post-NSPS units are boilers with greater than 250 MMBtu/hr of heat input that commenced construction modification, or reconstruction after August 17, 1971, and units with heat input capacities between 100 and 250 MMBtu/hr that commenced construction modification, or reconstruction after June 19, 1984.

TABLE 1.4-3. EMISSION FACTORS FOR SPECIATED ORGANIC COMPOUNDS FROM NATURAL GAS COMBUSTION[a]

CAS No.	Pollutant	Emission Factor ($lb/10^6$ scf)	Emission Factor Rating
91-57-6	2-Methylnaphthalene[b, c]	2.4E-05	D
56-49-5	3-Methylchloranthrene[b, c]	<1.8E-06	E
	7,12-Dimethylbenz(a)anthracene[b,c]	<1.6E-05	E
83-32-9	Acenaphthene[b,c]	<1.8E-06	E
203-96-8	Acenaphthylene[b,c]	<1.8E-06	E
120-12-7	Anthracene[b,c]	<2.4E-06	E
56-55-3	Benz(a)anthracene[b,c]	<1.8E-06	E
71-43-2	Benzene[b]	2.1E-03	B
50-32-8	Benzo(a)pyrene[b,c]	<1.2E-06	E
205-99-2	Benzo(b)fluoranthene[b,c]	<1.8E-06	E
191-24-2	Benzo(g,h,i)perylene[b,c]	<1.2E-06	E
205-82-3	Benzo(k)fluoranthene[b,c]	<1.8E-06	E
106-97-8	Butane	2.1E+00	E
218-01-9	Chrysene[b,c]	<1.8E-06	E
53-70-3	Dibenzo(a,h)anthracene[b,c]	<1.2E-06	E
25321-22-6	Dichlorobenzene[b]	1.2E-03	E
74-84-0	Ethane	3.1E+00	E
206-44-0	Fluoranthene[b,c]	3.0E-06	E
86-73-7	Fluorene[b,c]	2.8E-06	E
50-00-0	Formaldehyde[b]	7.5E-02	B
110-54-3	Hexane[b]	1.8E+00	E
193-39-5	Indeno(1,2,3-cd)pyrene[b,c]	<1.8E-06	E
91-20-3	Naphthalene[b]	6.1E-04	E
109-66-0	Pentane	2.6E+00	E
85-01-8	Phenanathrene[b,c]	1.7E-05	D

TABLE 1.4-3. EMISSION FACTORS FOR SPECIATED ORGANIC COMPOUNDS FROM NATURAL GAS COMBUSTION (Continued)

CAS No.	Pollutant	Emission Factor ($lb/10^6$ scf)	Emission Factor Rating
74-98-6	Propane	1.6E+00	E
129-00-0	Pyrene[b, c]	5.0E-06	E
108-88-3	Toluene[b]	3.4E-03	C

[a] Reference 11. Units are in pounds of pollutant per million standard cubic feet of natural gas fired. Data are for all natural gas combustion sources. To convert from $lb/10^6$ scf to $kg/10^6$ m^3, multiply by 16. To convert from $1b/10^6$ scf to lb/MMBtu, divide by 1,020. Emission Factors preceeded with a less-than symbol are based on method detection limits.

[b] Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act.

[c] HAP because it is Polycyclic Organic Matter (POM). POM is a HAP as defined by Section 112(b) of the Clean Air Act.

[d] The sum of individual organic compounds may exceed the VOC and TOC emission factors due to differences in test methods and the availability of test data for each pollutant.